APPENDIX D

Staff Recommendations for Agricultural Order

Options Considered

Order Structure, Monitoring, Reporting, Management Practice and Discharge Control, and Riparian/Wetland Area Protection Requirements

CENTRAL COAST REGIONAL WATER QUALITY CONTROL BOARD

November 2010

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Options Considered

Water Board staff considered options during the development of the proposed Order and the proposed monitoring and reporting program. Options were considered for:

- Structure of the Order
- Monitoring
- Reporting
- Management Practices or Other Discharge Controls
- Riparian and Wetland Area Protection Requirements

These options are discussed below.

I. Order Options

1. Introduction

During preparation of the proposed 2011 Draft Order, Water Board staff considered several regulatory options and subgroups or tiers within these options to group similar dischargers together and to set distinct requirements (for implementation, monitoring and reporting) for each group. The regulatory options considered included Waste Discharge Requirements (WDRs), or Waivers of WDRs with Conditions (Conditional Waivers). A discussion of requirements for WDRs and conditional waivers is in Appendix I.

Water Code section 13263 of the California Water Code (CWC) authorizes the State and Regional Water Boards to issue WDRs for projects or activities that would discharge waste to ground or surface waters within State boundaries.

Water Code section 13260 requires that:

> *"…any person discharging waste, or proposing to discharge waste that could affect the quality of the waters of the State, [to] file a report of discharge (an application for waste discharge requirements) along with a filing fee, in anticipation that the Regional Water Board will provide waste discharge requirements."*

In the event a discharger files a Report of Waste Discharge (ROWD), the Water Board is obligated to prescribe WDRs except where the Water Board finds that a waiver of WDRs for a specific type of discharge is in the public interest. Water Code section 13269 allows the Water Board to waive submission of ROWDs and/or issuance of WDRs. Conditional waivers of WDRs are limited to five years in duration, must include specific conditions aimed to protect water quality, and may be terminated at any time by the Water Board. The Water Code requires that conditional waivers and WDRs be consistent with any applicable water quality control plan.

Staff first evaluated continuing the current Order (adopted in 2004, renewed twice and currently labeled Order R3-2010-0040, herein referred to as the 2004 Order), which is a Conditional Waiver, and other variations on Conditional Waivers, since that is the current type of Order used to regulate agricultural waste discharges. Water Board staff then considered a variety of grouping or tiered approaches within a Conditional Waiver. Staff also evaluated WDRs and combinations of these regulatory tools as additional options.

Staff considered several variations on tiering by considering all or some of several criteria that indicate an operation's threat to water quality. For the options considered, staff evaluated the advantages and disadvantages of focusing only on criteria indicating actual discharge of waste (e.g., volume and quality of discharge) versus focusing on multiple additional indicators of threats to water quality, such as size and location of operation, chemicals used, crop types, etc. The following is a list of criteria considered.

- Presence/volume of non-stormwater discharge
- Presence of stormwater discharge
- Quality of discharge or runoff
- Presence of erosion
- Fertilizer use
- Chemical pesticide use
- Crop types
- Nitrate Hazard Index[1]
- Proximity to an impaired watercourse
- Potential for groundwater discharge
- Existing level of implementation to control or discharge or reduce loading

The discussion below includes an option identical to the 2004Order or Conditional Waiver of WDRs, an option identical to the February 1, 2010 Preliminary Draft Order or Conditional Waiver (February 2010 Preliminary Draft Order), and other options that propose tier structures to address issues raised in comment letters and at the 2010 Water Board public workshops (May 12 and July 8).

2. Options

Option 1- Conditional Waiver 1

This option is identical to the 2004 Order. The intent of this option is to ensure that all farm operations are actively protecting surface water quality, that water quality objectives are being met in receiving surface water, and that beneficial uses of water are protected or restored. For groundwater the 2004 Order requires operators to prevent additional degradation of groundwater and to achieve gradual improvements in groundwater quality. Operators are required to implement management practices to meet these goals and conditions.

This conditional waiver option includes two Tiers. Tier 1 (five-year waiver) is intended for those dischargers that have already completed a minimum of fifteen hours of farm water quality training, have completed farm water quality plans, and have begun the process of implementing management practices to protect water quality. Tier 1 waivers are valid for five years or the length of time remaining in the five-year waiver cycle.

1 Nitrate Hazard Index serves to provide information for farmers to voluntarily target resources for management practices that will yield the greatest level of reduced nitrogen contamination potential for groundwater by identifying the fields of highest intrinsic vulnerability. The index works with an overlay of soil, crop, and irrigation information. Based on the three components, an overall potential hazard number is assigned and management practices are suggested where necessary (Delgado et. al. 2008).

Tier 2 (one-year waiver) is intended for those dischargers that cannot meet all requirements of Tier 1 by the enrollment deadline of December 1, 2004. Tier 2 waivers are renewable annually for a maximum of three years.

Advantages and Disadvantages

An advantage of this option is that the agricultural dischargers are familiar with it. There is already widespread enrollment and some observed and anecdotal evidence of management practice implementation.

A disadvantage of this option is the 2004 Order lacks clarity regarding implementation and compliance milestones. The 2004 Order does not include reporting or monitoring to provide accountability and verification for directly resolving the known water quality problems. The 2004 Order addresses all common problems associated with all agricultural operations equally without prioritizing water quality problems unique to a farm, without considering load contribution to nearby impaired water bodies. The 2004 Order does not include any specific targets or timelines for compliance or require direct submittal of evidence that loading or water quality of discharges are improving. Advantages and disadvantages of this option are summarized in **Table 1**.

Option 2- Conditional Waiver 2

This option, Conditional Waiver 2, is identical to the February 1, 2010 Preliminary Draft Agricultural Order (February Preliminary Draft Order**).** The February Preliminary Draft Order included conditions that apply to owners and operators (dischargers) of irrigated lands that discharge or have the potential to discharge waste that could directly or indirectly reach waters of the State and affect the quality of any surface water or groundwater. The February Preliminary Draft Order aimed to resolve pollution in agricultural areas by directly addressing agricultural discharges to surface and ground.

The February Preliminary Draft Order did not refer to tiers but established one set of conditions for "low-risk" discharges and another set of conditions for all other dischargers. However, to facilitate comparison between options, the two sets of conditions in the will be referred to as Tier 1 and Tier 2.

Tier 1 was for those dischargers considered low risk that:

- Do not discharge non-stormwater (e.g. tailwater)
- Are 1000 feet away from an impaired watercourse
- Do not use pesticides identified as having a high potential to contaminate surface water
- Have irrigation that water meets nitrate water quality objectives
- Implement a nutrient management plan
- Implement management measures to control stormwater runoff

Staff recommended these "low-risk discharges" to be lowest priority for any regulatory action, unless information became available to suggest otherwise. In addition, these "low-risk discharges" would not be subject to any individual water quality monitoring and reporting requirements, unless otherwise specified. The Executive Officer would determine whether a discharger is in this "low risk" category.

Tier 2 was for all other dischargers not considered "low-risk." Tier 2 dischargers are farm operations that:

- Discharge non-stormwater (e.g. tailwater)
- May or may not be 1000 feet away from an impaired watercourse
- Use pesticides identified as having a high potential to contaminate surface water
- Have irrigation that water does not meet nitrate water quality objectives
- May or may not implement a nutrient management plan
- May or may not implement management measures to control stormwater runoff

Staff considered these discharges to be highest priority for any regulatory action, unless information was available to suggest otherwise. In addition, these discharges would be subject to individual water quality monitoring and reporting requirements, unless otherwise specified.

Compared to the 2004 Order, this option (the February Preliminary Draft Order), included conditions that required specific and complex management practice implementation and significant reporting. The purpose of the specificity and complexity of practices and reporting was to provide verification of both general effectiveness of the practices or controls implemented by dischargers. Additionally, the conditions in this option required demonstration that water quality standards or load reduction targets were met in specific timeframes.

Advantages and Disadvantages

An advantage of this option is the February Preliminary Draft Order proposed conditions, monitoring, and reporting that directly addressed agricultural discharges. The proposed February Preliminary Draft Order focused on the control and/or elimination of pollutant loading from non-stormwater, irrigation runoff and percolation of irrigation water to groundwater. The February Preliminary Draft Order also included clear and direct methods and indicators for verifying compliance and monitoring progress over time.

A disadvantage of this option is that the conditions apply to multiple farm operations similarly, with the exception of the limited number of operations that would be in Tier 1 or "low-risk" dischargers. . For example, farm operations discharging clean non-stormwater had some of the same requirements as those discharging polluted non-stormwater. The proposed February Preliminary Draft Order required monitoring and report submittal from all individual farms. This would likely have caused a burden of effort and cost to some operations that may not have been significant dischargers and would likely have caused a significant work load for Water Board staff in terms of report review and data management. Advantages and disadvantages of this option are summarized in **Table 1**.

Options 3 – 7, Conditional Waivers with Tiering Variations

The next five waiver options were evaluated for inclusion in the 2011 Draft Order. All of these next five options vary predominately in terms of the criteria and approaches to grouping dischargers into tiers. Generally, each option groups dischargers in tiers or levels based on threat to water quality. In all these options, criteria are organized into groups to indicate how they apply as lower versus higher threat to water quality.

Detailed conditions were not developed for each of these options uniquely or different than the conditions generally described for Option 2 above. In all these options, dischargers with the highest threat would have the greatest amount of individual monitoring and reporting. Conversely, dischargers with the lowest threat would have the

least amount of individual monitoring and reporting. Each tier would require the effective implementation of management strategies for the protection of water quality. Each of the tiers would have different monitoring and reporting requirements. These options provide variation in milestones and timelines across tiers. The highest tiers would have specific requirements for verifying compliance and meeting time schedules.

The discussion below compares the most complex tiering structure considered to the simplest to illustrate the complexity involved in determining appropriate tiers and some of the advantages and disadvantages of the different tiering structures.

Option 3, Conditional Waiver 3

This option considered three tiers. The tiers were distinguished by four criteria to evaluate farm operations: size of farm operation, proximity to an impaired watercourse, use of chemicals of concern, and type of crop grown. A summary of the criteria used to determine the placement of each farm operation into a Tier is outlined below:

Tier 1 applies to dischargers who appear to discharge the lowest level of waste or pose the least threat to water quality. Tier 1 farm operations:

- Are 1000 feet away from an impaired watercourse and,
- Do not use chlorpyrifos or diazinon and,
- Are less than 1000 acres in size

Tier 2 applies to dischargers who appear to discharge a moderate level of waste or pose a moderate threat to water quality. Tier 2 farm operations fit one of the following sets of criteria:

- Within 1000 feet of an impaired watercourse , and
- Less than 1000 acres in size, and
- Does not use chlorpyrifos or diazinon, **or**

- NOT within 1000 feet of an impaired waterbody, and
- Less than 1000 acres in size, and
- Uses chlorpyrifos or diazinon, **or**

- NOT within 1000 feet of an impaired waterbody, and
- Greater than 1000 acres in size, and
- Does not use chlorpyrifos or diazinon, and
- Does not grow crop types with high potential to discharge nitrogen to groundwater

Tier 3 applies to dischargers who appear to discharge the highest level of waste or pose the greatest threat to water quality. Tier 3 farm operations:

- Within 1000 feet of an impaired watercourse, and
- Greater than 1000 acres in size, and
- Use chlorpyrifos or diazinon, and
- Grows crop types with high potential to discharge nitrogen to groundwater.

In this option, Tier 3 dischargers with the highest threat would have the greatest amount of individual monitoring and reporting. Conversely, Tier 1 dischargers would have the least amount of individual monitoring and reporting.

Advantages and Disadvantages
An advantage of this option is there are only three tiers and each tier is unique. In this option, it is fairly easy to determine which tier an operation should be in, and simple, known criteria inform the tiers. This option uses criteria that indicate threat to water quality. Water Board staff will be better able to receive, manage and review monitoring and reports that are limited to meeting three sets of conditions associated with only three tiers.

A disadvantage is that operations are grouped into three simple tiers so this option may not address the diversity of the various operations as well as an option with more tiers. Advantages and disadvantages of this option are summarized in **Table 1**.

Option 4, Conditional Waiver 4
This option would establish four levels each for surface and ground water based on threat to water quality. The threat to surface and ground water quality would be indicated by the following criteria to evaluate farm operations: presence/absence of non-stormwater discharge to surface or ground water, water quality (nitrate, toxicity, and turbidity), and management practice implementation (e.g. properly sealed wells, backflow protection, etc.). The surface water levels are summarized below:

- Level 1S– No discharge
- Level 2S– Clean and small volume non-storm water discharge
- Level 3S– Moderately polluted and/or medium volume non-storm water discharge
- Level 4S– Severely polluted and/or large volume non-storm water discharge

The groundwater levels are summarized below:

- Level 1G– No discharge, management practices in place
- Level 2G– Minimal volume of non-storm water discharge to ground, management practices in place, ponded water not discharged to ground surface
- Level 3G – Minimal volume of non-storm water discharge to ground, management practices in not in place, ponded water discharged to ground surface
- Level 4G – Non-storm water discharge to ground, management practices in not in place, ponded water discharged to ground surface

Tier 4S/4G dischargers would be considered high threat. Tier 4S/4G dischargers would have the greatest amount of individual monitoring and reporting. Conversely, Tier 1S/1G dischargers would be considered lower threat and have the least amount of individual monitoring and reporting.

Advantages and Disadvantages
An advantage of this option is each level is unique and there are multiple combinations of the levels, or tiers. This allows for 16 different tiers and recognizes the diversity of the types of operations. An Order with this type of tiering structure would set conditions that better fit the variety of operations by having many tiers. These criteria indicated threat to water quality well.

A disadvantage is that it will be harder to evaluate which tier applies to operations or fields. Water quality sampling and other measurements or field surveys would be

needed to determine the tiers. Water Board staff would have to review and verify information to determine which tier applies to operations or fields. Operations may have multiple fields that fit different tiers and this may change with each planting season based on crops and irrigation systems. Water Board staff would have to receive, manage and review different sets of information submitted for compliance with different sets of conditions for multiple tiers. Advantages and disadvantages of this option are summarized in **Table 1**.

Option 5, Conditional Waiver 5

This option establishes three levels for surface water and two levels for groundwater. The levels considered the following criteria to evaluate farm operations: presence/absence of non-stormwater discharge to surface water, concentration of nitrate in discharge, and chemicals used. The surface water levels are summarized below:

- Level 1S – Farm operations with no non-storm water discharge or a farm operation with a non-storm water discharge that meets nitrate water quality objectives and does not use diazanon, chlorpyrifos or pyrethroids.
- Level 2S – Farm operation with a non-storm water discharge that is moderately polluted and uses diazanon, chlorpyrifos or pyrethroids.
- Level 3S – Farm operation with a non-storm water discharge that is severely polluted and uses diazanon, chlorpyrifos or pyrethroids.

The threat to groundwater quality considers only the groundwater nitrate concentration to evaluate farm operations: The groundwater levels are summarized below:

- Level 1G – Groundwater meets water quality objectives
- Level 2G – Groundwater does not meet water quality objectives

Tier 3S/2G dischargers are considered high threat. Tier 3S/2G dischargers would have the greatest amount of individual monitoring and reporting. Conversely, Tier 1S/1G dischargers would be lower threat and have the least amount of individual monitoring and reporting.

Advantages and Disadvantages

Advantages and disadvantages of this option are similar to those described above for Option 4 which also has several tiers based on multiple criteria that require the dischargers to monitor measure or survey in order to determine which tier applies and Water Board staff would have to review the information and verify tiers. Advantages and disadvantages of this option are summarized in **Table 1**.

Option 6, Conditional Waiver 6

This option would establish three levels for surface water and three levels for groundwater. The levels would be indicated by the following criteria to evaluate farm operations: presence/absence of non-stormwater discharge to surface water, concentration of nitrate in discharge, and chemicals used. The surface water levels are summarized below:

- Level 1S – No discharge or clean with a small volume non-storm water discharge
- Level 2S – Moderately polluted (elevated nitrate and use of chemicals of concern) and/or medium volume non-storm water discharge
- Level 3S – Severely polluted (elevated nitrate and use of chemicals of concern) and/or large volume non-storm water discharge

The threat to groundwater quality considers the following criteria to evaluate farm operations: concentration of nitrate in discharge to groundwater and Nitrate Hazard Index factor. The groundwater levels are summarized below:

- Level 1G – Nitrate Hazard Index factor for crop types 1 and 2 and groundwater meets water quality objectives
- Level 2G – Nitrate Hazard Index factor for crop types 3 and groundwater moderately polluted (elevated nitrate)
- Level 3G – Nitrate Hazard Index factor for crop types 4 and groundwater severely polluted (elevated nitrate)

Tier 3S/3G dischargers would be considered high threat. Tier 3S/3G dischargers have the greatest amount of individual monitoring and reporting. Conversely, Tier 1S/1G dischargers would be considered lower threat and have the least amount of individual monitoring and reporting.

Advantages and Disadvantages

Advantages and disadvantages of this option are similar to those described above for Options 4 and 5 which also have several tiers based on multiple criteria that require the dischargers to monitor measure or survey in order to determine which tier applies and Water Board staff would have to review the information and verify tiers. Advantages and disadvantages of this option are summarized in **Table 1**.

Option 7, Conditional Waiver 7

This option establishes three tiers. The three tiers are Low-Threat, Medium-Threat, and High-Threat farm operations. The tiers consider eight criteria to evaluate farm operations: presence/absence of non-stormwater discharge to surface water, stormwater discharge, presence/absence of erosion, amount of fertilizer used, chemicals used, Nitrate Hazard Index factor (Crop types 1, 2, 3, and 4), proximity to an impaired watercourse, and threat of groundwater discharge. A summary of the criteria that would be used to determine the placement of each farm operation into a Tier is outlined below:

- Low-Threat farm operations:
  - No non-stormwater discharge
  - Limited stormwater discharge
  - Limited erosion
  - Limited fertilizer use
  - No chemical pesticide use
  - Crop types with Nitrate Hazard Index factor 1 and 2
  - 1000 feet away from an impaired watercourse
  - Low threat groundwater discharge

- Medium-Threat farm operations:
  - Limited non-stormwater discharge
  - Limited stormwater discharge
  - Limited erosion
  - Limited fertilizer use
  - Limited pesticide use
  - Crop types with Nitrate Hazard Index factor 3
  - 1000 feet away from an impaired watercourse
  - Medium threat groundwater discharge

- High-Threat farm operations:
  - Unlimited non-stormwater discharge
  - Unlimited stormwater discharge
  - Unlimited erosion
  - Unlimited fertilizer use
  - Unlimited pesticide use
  - Crop types with Nitrate Hazard Index factor 4
  - Within 1000 feet of an impaired watercourse
  - High threat groundwater discharge

High-Threat farm operations (dischargers) have the greatest amount of individual monitoring and reporting. Conversely, Low-Threat dischargers are considered have the least amount of individual monitoring and reporting.

Advantages and Disadvantages

This option has some of the advantages of Option 3 because it only has three tiers. In this option it is fairly easy to distinguish between the tiers and level of threat. Water Board staff will be better able to receive, manage and review monitoring and reports that are limited to meeting three sets of conditions associated with only three tiers. This option also uses criteria that indicate threat to water quality.

A disadvantage of this option, similar to Options 4-7, is the evaluation of multiple criteria and the need for dischargers to monitor measure or conduct field surveys to determine the criteria. Similarly, this option requires more effort from Water Board staff to review information to verify the tier assignments. Achieving defined fertilizer use levels or pesticide use levels may be problematic given the variation in crop type across a single farm operation. This gets further complicated by soil types, irrigation patterns, and crop rotation. Advantages and disadvantages of this option are summarized in **Table 1**.

Option 8 Conditional Waiver plus Waste Discharge Requirements

This option includes three groupings. Grouping of farm operations is based on presence/absence of non-stormwater discharge, proximity to an impaired watercourse, and management practice implementation. Two groups, Low Threat discharges on unimpaired/impaired waterbodies and Medium-Threat discharges on unimpaired waterbodies are discharges that would be regulated through a conditional waiver. High-Threat discharges would be regulated through WDRs. The groups are summarized below:

- **Conditional Waiver**
  - Low-Threat Discharges on Unimpaired/Impaired Waterbodies - Farm operations with no non-storm water discharge, 1000 feet away from an impaired watercourse, and implements required management practices for the protection of water quality and associated resources.
  - Medium-Threat Discharges on Unimpaired Waterbodies - Farm operations with non-storm water discharge, within 1000 feet of an impaired watercourse, and do not implement required management practices for the protection of water quality and associated resources.
- **Waste Discharge Requirements**
  - High-Threat Discharges on Impaired Waterbodies - Farm operations with non-storm water discharge, within 1000 feet of an impaired watercourse, and

do not implement required management practices for the protection of water quality and associated resources.

Those farm operations that are included in the WDR group are considered high threat. The WDR dischargers have the greatest amount of individual monitoring and reporting. Conversely, the farm operations that are included in the conditional waiver group are considered lower threat and have the least amount of individual monitoring and reporting. Within the conditional waiver group, dischargers considered medium-threat will have more monitoring and reporting than those dischargers considered low-threat.

Advantages and Disadvantages

An advantage of this option is there are only two groups and each group is unique. Within the conditional waiver group, dischargers on unimpaired waterbodies, have the option to manage a farm operation to reduce the threat to water quality. The monitoring and reporting requirements associated with each group and within the conditional waiver group, encourage dischargers to manage a farm operation such that discharges meet water quality objectives and can be considered low threat. Another advantage is once a waterbody moves from a condition of impaired to unimpaired, then all "high-threat" discharges on that waterbody are now considered medium threat. Moving from high-threat to medium–threat reduces monitoring, reporting, and costs.

A disadvantage is the use of two different regulatory tools which makes it more cumbersome for dischargers to move between groups. Movement from a WDR to a conditional waiver will require a Water Board hearing to rescind a WDR and then enrollment of that farm operation into the conditional waiver. The conditional waiver and WDRs will have different monitoring and reporting requirements and the discharger will need to modify their regulatory submissions to respond to those differences. Also, change in the monitoring and reporting submittals from individual farms may create a significant work load for Water Board staff in terms of report review and data management. Advantages and disadvantages of this option are summarized in **Table 1**.

Option 9, Conditional Waiver, and Waste Discharge Requirements

This option includes three groupings. Grouping of farm operations is based on presence/absence of non-stormwater discharge, discharge water quality, and management practice implementation. This option is similar to Option 8 but would use different criteria to indicate the groups. The conditional waiver group has two levels (Level 1 and Level 2) and each level has different monitoring and reporting requirements depending on presence/absence of non-stormwater discharge, chemical uses, discharge water quality, and groundwater quality. WDRs (Level 3) are for those farm operations with greatest potential to impact water quality and associated beneficial uses. The groups are summarized below:

a. Conditional Waiver
   - Level 1 - Farm operations with no non-storm water discharge or a farm operation that does not use diazanon, chlorpyrifos or pyrethroids, the non-storm water discharge meets nitrate water quality objectives, and groundwater meets nitrate water quality objectives.
   - Level 2 – Farm operation with non-storm water discharge uses diazanon, chlorpyrifos or pyrethroids, the non-storm water discharge slightly above nitrate water quality objectives, and groundwater meets nitrate water quality objectives.

b. Waste Discharge Requirements
   - Level 3 – Farm operation with non-storm water discharge uses diazanon, chlorpyrifos or pyrethroids, the non-storm water discharge significantly above nitrate water quality objectives, and groundwater nitrate is above water quality objectives.

Those farm operations that would be included in the WDR group would be considered high threat. Farm operations included in the conditional waiver group would be considered lower threat and have less monitoring and reporting than the WDR group. Within the conditional waiver group, dischargers considered Level 2 will have more monitoring and reporting than those dischargers considered Level 1.

Advantages and Disadvantages
The advantages and disadvantages of this option are similar to those for Option 8 which also has of the same two regulatory tools, Conditional Waiver and WDRs. The WDR group will focus on discharges that have the greatest potential to impact water quality. Bringing these discharges into compliance with water quality objectives should result in improved water quality and optimal uses of resources. Advantages and disadvantages of this option are summarized in **Table 1**.

Option 10, Waste Discharge Requirements

This option considers Waste Discharge Requirements for all farm operations. Each farm operation would have individual WDRs and individual monitoring and reporting programs.

Advantages and Disadvantages
An advantage of this option is there is a single group and no tiers. For each farm operation, monitoring and reporting requirements would be developed for that operation. Over time each farm operation could capitalize on information about their operation to manage discharges to meet water quality objectives and be protective of resources.

A disadvantage of individual WDRs for all farm operations is that it would likely create a significant work load for Water Board staff in terms of Order development, report review, and data management. Advantages and disadvantages of this option are summarized in **Table 1**.

Table 1: Evaluation of Order and Tiering Options

Options:	1	2	3	4	5	6	7	8	9	10
Issue										
Tiers										
Multiple (more than three)				X	X	X				
Easy to determine	X		X							X
Distinguish threat of discharge			X	X	X	X	X		X	
Complex				X	X	X	X		X	X
Responsive to water quality	X	X	X	X	X	X	X	X	X	X
Reasonable										
Manageable by dischargers	X		X							
Manageable by Water Board	X		X				X			
Appropriate to water quality		X	X	X	X	X	X	X	X	X
Appropriate to discharge conditions		X	X	X	X	X	X	X	X	X
Responsive to comments										
Addresses diversity of operations	N/A	N/A		X	X	X	X		X	X
Addresses water quality conditions	N/A	N/A	X	X	X	X	X		X	X
Fewer requirements for lower tiers/threat	N/A	N/A	X	X	X	X	X		X	X

3. Evaluation and Discussion

Water Board staff considered a variety of regulatory tools and combinations of those tools for the management of agriculture discharges. Each regulatory tool can be structured to achieve protection of water quality and associated beneficial uses. Combining different regulatory tools allows flexibility, but also adds to the complexity of any management effort. Compounding program management is the number of farm operations and the difference in the farm operations which adds another layer of complexity to the use of any regulatory tool. Additionally, WDRs and conditional waivers have subtly different regulatory requirements.

With program implementation in mind, Water Board staff prefers the use of a conditional waiver with tiers. This is also the regulatory tool familiar to the agricultural community since it is the regulatory tool for the 2004 Order. A waiver with tiers was developed with conditions that separate discharges based on threat to water quality. Water Board staff considered a variety of criteria for establishing a conditional waiver with tiers. Many of the criteria were specifically indicators of threat to water quality. One criterion of particular concern was the presence/absence of non-stormwater discharge to surface or ground water. Non-stormwater discharge from agriculture operations containing pollutants (e.g. nitrate, toxic chemicals, sediment, etc.) is known to contribute to water quality degradation. Treatment, reduction or elimination of discharges, so that the receiving water bodies meet water quality objectives, will be protective of water quality and associated beneficial uses. This criterion appeared in several of the options and is included in the preferred option.

Another criterion that appears to work well for tiering is the Nitrate Hazard Index factor. This criterion provides a simple assessment of the threat to water quality from a

particular farm operation. Use of this criterion requires knowledge of the crop type and this type of information is easily available.

Criteria like the amount of stormwater discharge, presence/absence of erosion, and concentration of nitrate in discharge also indicate threat to water quality but are more difficult to assess. Concentration of nitrate in discharge requires sample collection and analysis. To add to the complexity, the amount of nitrate in a sample is a function of how much was applied, when it was seasonally applied, where in the crop cycle it was applied, and conditions (where, when, etc.) with respect to sample collection. For example, for a farm operation with a discharge that varies in nitrate concentration, the use of a grab sample to evaluate this criterion will not accurately represent the variation in nitrate quantity discharged. Similarly, criteria like stormwater and erosion discharge are episodic. To accurately represent these types of discharges may require sample collection over extended periods (e.g. 24-hour continuous sampling). However, a 24-hour continuous stormwater discharge (flow) sample collection does allow for the calculation of discharge load. In any case, less frequent or one-time sampling may inform general characteristics of the discharge.

The complexity of resulting tiers or levels depends on which of the criteria are selected, how many criteria are used, and how the criteria are grouped. For example in Option 4, Conditional Waiver 4, this option establishes four levels each for surface and ground water, using presence/absence of non-stormwater discharge to surface or ground water, water quality (nitrate, toxicity, and turbidity), and management practice implementation (e.g. properly sealed wells, backflow protection, etc.). The resulting four surface water levels and four groundwater levels can be grouped into 16 different combinations of levels. The multiple combinations add complexity in that an individual farm operation may have multiple fields that have different level groupings. The groupings are further complicated because management actions implemented for a farm operation may result in reclassification of a farm operation or a portion of a farm operation into another level. Tracking the movement of those fields into different levels as crops rotate over the course of a normal growing season has the potential to create a very large data set. That data set may be of limited utility as the information will chronically lag behind changes in field operations.

Water Board staff also considered how many farm operations would be in each group based on the criteria selected. Water Board staff determined that it was beneficial to create a set of criteria that allowed the dischargers with the greatest potential to impact water quality to be easily identified and would result in those high threat dischargers being placed in the same tier. This makes it easier to scale or adjust implementation and monitoring requirements appropriate to the discharge threat in each tier and allows dischargers more clarity about the level of implementation to reduce pollutant loading and Water Board staff more clarity about priorities for program implementation (e.g., inspections, review of reported data) and enforcement. This approach to tiering provides a program that can be designed and implemented to improve and protect water quality and that is most manageable. The tiering criteria would be most effective if they can also be used to distribute all other lower threat dischargers across other tiers. If a set of criteria resulted in all dischargers being in the same tier, the result would undermine the utility of a tiered program. Option 1, essentially the 2004 Order, for example, only distinguishes discharges based on level of education and groups all dischargers (a few thousand operations) into one tier for implementation requirements. This creates a greater burden on dischargers and Water Board staff to determine which operations are

higher threat, polluting, or are in compliance. Option 2, the February Preliminary Draft Order, groups dischargers into two tiers with the low threat discharge criteria such that few dischargers would fall into this group. This creates a similar burden as Option 2. Option 3 through 7, Conditional Waivers with tiering variations, separates dischargers into more tiers than Option 1 or 2. Option 3, for example, distributes a small number of the highest threat dischargers into Tier 3 (150 to 300), and the remaining dischargers into Tier 2 (900 to 1200) and Tier 1 (1400 to 1600).

The ease or difficulty in assessing or quantifying a particular criterion is important in selection of that criterion for a tier process. Similarly, evaluation of the number of criteria and the combination of those criteria for a tier process is critical for creating a process that is appropriate for the protection of water quality, is understandable, and manageable.

4. Recommendation

In an effort to develop a set of appropriate tiers, Water Board staff considered need for water quality protection, the water quality conditions and proximity of operations to degraded waterbodies, the need for compliance verification, and the practicality of managing the program and enforcement. Water Board staff also considered public comment directed at achieving the simplicity of the 2004 Order, for example, concerns about the difficulty associated with individual monitoring, the submittal of farm operation proprietary information, and the burden of extensive reporting.

In consideration of the various factors, Water board staff recommends Option 3, Conditional Waiver 3**.** This option has three tiers. The option uses four criteria to evaluate farm operations: size of farm operation, proximity to an impaired watercourse, use of chemicals of concern, and type of crop grown. These criteria are indicators of water quality threat from an operation and larger size potentially causes more pollutant loading. Also, farm operation location close to an impaired waterbody has greater potential to contribute pollutants to the waterbody and use of chemicals indicates potential contributions to toxicity in waterbodies. Finally, crop type indicates potential for nitrate loading to both surface and groundwater. All of the criteria evaluated are known to a farm operation without any sample collection or analysis. Size of the farm operation and proximity of the farm operation to an impaired watercourse are relatively static. Type of crop grown varies over the course of a growing cycle and this is known to the agriculturalist, as is use of chemicals. Option 3 distributes dischargers into the three tiers in these approximate numbers: Tier 1 - 1400 to 1600, Tier 2 - 900 to 1200 and Tier 3 - 150 to 300.

The structure of the Conditional Waiver 3 tiers promotes different levels of implementation (source or discharge control) for individual farm operations. Monitoring and reporting proposed is appropriate for operations where more effort or tracking is needed to improve and protect water quality. This option allows for focus on significant discharges with the greatest potential to impact water quality and associated beneficial uses.

II. Monitoring Program Options

Introduction

This section reviews the adequacy and effectiveness of the existing monitoring program described in MRP No. 2011-0006, describes the basic components of the various monitoring options under consideration, describes the monitoring options themselves, compares the advantages and disadvantages of each option, and makes a staff recommendation for a favored option.

A. Review of Existing Monitoring Program

Staff evaluated the Monitoring and Reporting Program (MRP) No. R3-2004-0117, for the 2004 Order (2004 MRP). The MRP orders dischargers to either participate in a "cooperative" or grouped receiving water monitoring program conducted by a third-party (specifically in this case, the Cooperative Monitoring Program (CMP) run by the nonprofit organization, Central Coast Water Quality Preservation, Inc.) or to conduct individual discharge monitoring.

The CMP focuses on currently applied agricultural constituents, meaning potential impacts from fertilizers and pesticides, as opposed to habitat or sediment impacts. The program is designed to provide information on in-stream water quality and to detect trends over time (see Appendix G for water quality information and discussion). Water Board staff use data collected and reported through the CMP to determine the effectiveness of Order conditions for the protection of water quality and associated beneficial uses, and to understand if progress is being made to improve water quality at the level of individual streams and their tributaries. This allows staff to understand in which creek areas growers are making effective changes, and which areas additional effort is required.

The MRP includes two basic components, including long-term trend monitoring at 50 sites in areas that are impaired by agricultural chemicals, and "follow-up" monitoring targeted at further identifying sources of problems as part of the CMP. In addition, the MRP provides for the Water Board to direct a discharger to conduct individual monitoring if necessary.

Site locations for the CMP trend program are typically located at the lower ends of small agricultural watersheds, or are located in a way to best isolate impacts from agricultural lands in mixed use areas. In some locations it is difficult to clearly separate land use sources, but follow-up studies have been used to help provide additional clarifying information. Sites were selected in areas where the Regional Board's Central Coast Ambient Monitoring Program (CCAMP) and other data identified water quality problems from nutrients and other constituents likely attributable to irrigated agriculture.

The 50 sites are monitored on a monthly basis for most constituents; this frequency is selected to enable the program to detect water quality improvements within a five-year time frame, if that improvement is sufficient to be statistically significant. Data are evaluated to determine if implementation of agriculture management practices are adequate and effective for the protection of in-stream water quality and associated beneficial uses. As stated above, monitoring must verify the adequacy and effectiveness of the Order's conditions.

Broad objectives of the cooperative monitoring program as defined by the 2004 Order are:

Short Term Objectives

- Assess status of water quality and associated beneficial uses in agricultural areas
- Identify problem areas associated with agricultural activities, where Basin Plan objectives are not met and/or where beneficial uses are impaired
- Conduct focused monitoring to further characterize problem areas and to better understand sources of impairment.
- Provide feedback to agriculturalists in problem areas
- Require additional implementation, monitoring, and reporting as necessary to address problems

Long Term Objective

- Track changes in water quality and beneficial use support over time.
- Verify the adequacy and effectiveness of the Order's conditions.

Costs and Fees

The State has supported the CMP through grant funds beginning in 2005. In 2005 over $870,000 was used for program start-up and surface water monitoring in both Santa Maria River watershed and the Lower Salinas River watershed. In 2006 through 2009 another $1,500,000 was granted to the cooperative monitoring program for continued in-stream monitoring and follow-up monitoring. In addition to state funds agriculture operations contribute between $400,000 and $500,000 annually to support continued in-stream monitoring.

The CMP has developed a fee structure based on number of irrigated acres and the presence of "off property tailwater acres." There is a minimum contribution of $50 for irrigated farm operations of 50 acres or less. The fee is graduated over the next 51 to 500 acres at one or two dollars per acre depending on the presence of "off property tailwater acres." Over 500 acres there is an additional charge of $0.10 per acre. Finally, there is State Board fee of $0.15 per acre, with $0.03 per acre going to fund the administrative costs of the Preservation, Inc. the group that oversees the CMP. The CMP allows dischargers to pool resources to economically accomplish required monitoring and reporting.

Water Quality Information

Staff reviewed surface water information and data collected pursuant to 2004 Order (the 2004 MRP and 2004 Order does not require ground monitoring). Staff evaluated:

- Cooperative Monitoring Program (CMP) data
- Cooperative Monitoring Program reports

Additionally, Staff reviewed the Central Coast Ambient Monitoring Program (CCAMP) surface water data as detailed in Appendix D and reviewed available groundwater data (e.g. Department of Water Resources, Monterey County Water Resources Agency, etc.) as detailed in Appendix D.

Although there have been various agriculture management actions implemented over the term of the 2004 Order, data shows that conditions in numerous water bodies have not

improved over the first five-year term of the agricultural regulatory program. The data are clear that many Central Coast water bodies located in, or affected by agricultural areas, continue to exhibit degraded biological conditions, degraded physical conditions, and impaired water quality.

For short term objectives, the data are used to assess status of water quality and associated beneficial uses in agricultural areas, identify general problem areas associated with agricultural activities, and provide feedback to agriculturalists in some problem areas.

Strengths of Existing Monitoring

Water Board staff use the water quality information collected through the CMP and CCAMP for evaluating in-stream water quality, including benthic conditions. This "ambient" condition tells us whether the Order is ultimately effective, because it reflects the sum total of inputs from all discharges to each waterway. The CMP contributes far more information on toxicity in agricultural areas than CCAMP can, and also provides ongoing trend monitoring as opposed to the once every five years approach used in the CCAMP watershed rotation monitoring. This data density allows for better and quicker detection of change at sites that are most representative of agricultural discharges. Because the program includes flow monitoring, pollutant loading can be calculated, which is key information for assessing Total Maximum Daily Loads in these impaired waters.

All trend sites in the CMP are on waterbodies that are "impaired" by chemicals associated with agricultural activity. An important benefit of the data collected by the CMP is its use in determining whether these waterbodies, which are on the Clean Water Act 303(d) List of Impaired Waters, can be removed from the List. Data requirements for delisting are substantial (for conventional pollutants, at least 26 samples are required to prove the waterbody can be delisted; for toxic pollutants at least 16 samples are required). Similarly, Total Maximum Daily Load assessments in these waterbodies rely upon this monitoring to show whether the waterbodies have achieved their stated water quality targets. Without data proving receiving water is clean, these waterbodies will remain on the 303(d) list. Each of the 50 monitoring sites is located on a waterbody that is listed as impaired due to pollutants associated with agricultural activities (e.g. nitrate, toxicity, pesticides).

Weaknesses of the Existing Monitoring Program

The information collected from the CMP cannot be used to characterize sources of impairment at the level of the individual discharger. Follow-up monitoring to date has been directed at identification of chemicals causing toxicity, and at narrowing down source areas through upstream monitoring, but not at identifying sources at the level of the individual discharger.

The CMP can identify where in-stream water quality objectives are not being met, and where water quality is not improving. However, the program cannot assign responsibility for these problems, or inform staff of where to focus enforcement (at the level of the individual), given that the evaluation of water quality is strictly in-stream.

Neither the CMP nor CCAMP collect information regarding groundwater quality. The data reviewed and reported in Appendix D indicate severe groundwater impairment from nitrates making drinking water unsafe in agricultural areas.

CCAMP and the CMP collect only limited information regarding terrestrial riparian condition through physical habitat assessments associated with benthic condition monitoring.

These programs do not include collection of data on pollutant sources at a level (e.g., individual farm) that can be used to evaluate compliance with the Order by an individual discharger.

Most MRPs associated with Orders to control discharges of waste include receiving water and individual discharge monitoring to allow the Water Board and the public to determine if water quality and beneficial uses are protected, the Order is effective and dischargers are complying with the conditions of the Order.

B. Basic Components of Monitoring Options

The following basic components of the various monitoring options are described in this section. The six options that Staff has considered for the 2011 Draft Order are made up of these components, with some additional adjustments. The options are shown in the Section entitled "Options Considered"

Receiving water monitoring - This type of monitoring, such as that currently done by the Cooperative Monitoring Program for Agriculture under the 2004 Order, is conducted in receiving waterbodies (e.g. streams, drains, estuaries), rather than directly in discharges. There are different types of receiving water monitoring, including long-term trend monitoring at fixed sites, follow-up monitoring for problem solving, and stormwater monitoring.

Individual discharge monitoring – This type of monitoring assesses the quality of discharges leaving individual farm operations and entering surface or ground waters. Individual discharge monitoring includes an initial characterization of surface and/or groundwater discharges. For continuous discharge there is ongoing monitoring to establish compliance and assess loading to receiving waters.

Individual Riparian and wetland habitat monitoring – this is a photographic assessment of habitat quality and extent on agricultural land, done on each farm adjacent to waterways.

These basic components are described in detail below:

1. Receiving water monitoring

This type of monitoring, such as that currently done by the Cooperative Monitoring Program for Agriculture (CMP) under the 2004 Order, is conducted in receiving waterbodies (e.g. streams, drains, estuaries), rather than in discharges. Receiving water monitoring can be conducted "cooperatively" through third-party monitoring, though individuals have the option to conduct it on their own. To date, this monitoring has always been done cooperatively by the CMP, through funds provided by grants and discharger fees. The receiving water monitoring conducted under the 2004 Order includes two basic components: ongoing trend monitoring at fixed sites, and follow-up monitoring for problem-solving. A third type of receiving water monitoring, stormwater monitoring, is also described here. This is not currently a component of the CMP, but is proposed as an enhancement. There are other types of receiving water monitoring designs not described here, such as before/after, control/treatment, upstream/downstream, and/or pretreatment//post treatment monitoring.

Trend monitoring sites are typically monitored frequently enough (e.g. monthly) to show seasonal variability and to provide enough data to be able to show long-term trends over time (e.g. multiple years). They answer the question, "Is the water quality in this creek getting better?" Sites location is chosen to best represent water quality from areas of interest (e.g. a reach of stream draining an agricultural area), to integrate conditions over a broad length of a stream (e.g. at the bottom of a watershed), or to inform changes from an individual operation's or small area's discharge of pollutants into the receiving water body. Follow-up monitoring sites are sampled for a short "study" period, and allow additional questions to be answered about the trend data, such as better geographic isolation of problem areas, sources of problems, chemical cause of toxicity, etc. Stormwater monitoring is conducted during active storm events with the intent of capturing condition of water quality during runoff events, since some pollutants, like sediment and attached chemicals, move primarily during these events.

Overall, receiving water monitoring provides for long-term trend detection, status of water body conditions, spatial locations of water quality problems, and whether beneficial uses are being protected. This data can then inform staff decisions related to follow-up activities, 303(d) Listing, Total Maximum Daily Load development and compliance monitoring.

a. Trend Monitoring

For the CMP, fifty surface water monitoring sites are located on the main stems and tributaries of creeks and rivers in agricultural areas of the Region. Sites are located in areas where waters have shown impairment associated with agricultural activities. Monthly sampling is conducted for various parameters including but not limited to:

- Nutrients (mg/L)
  - measured –orthophosphate (as P), nitrate-nitrate (as N), total ammonia (as N)
  - calculated - unionized ammonia (as N)
- Oxygen (dissolved (mg/L) and percent saturation)
- Flow
- Turbidity (NTU)
- pH
- Total Dissolved Solids (mg/L)
- Chlorophyll a (µg/L)
- Conductivity (uS)
- Water Temperature (degrees C)
- Air Temperature (degrees C)
- Floating algal mat coverage (percent cover)

In addition to monthly sampling, monitoring sites are sampled for:

- Water toxicity
  - Twice during the dry season (May 15 – October 15).
  - Twice during the rainy season (October 15 – March 15). Rainy season sampling is conducted during or shortly after river runoff events, preferably including the first event that results in significant flow increase.
- Sediment toxicity is sampled once per year, in spring.
- Rapid bioassessment for benthic invertebrate assemblages is conducted concurrently with spring sediment sampling.

All sampling methodologies are consistent with the CCAMP monitoring approach and the Surface Water Ambient Monitoring Program Quality Assurance Program Plan.

b. Follow-up Monitoring

For the CMP per the existing MRP, any follow-up monitoring[2] is at the direction of the Water Board. Follow-up may be directed if water quality problems persist at any site monitored through the CMP. Follow-up monitoring requires additional sites be identified and sampled as necessary to conduct investigative monitoring. Follow-up costs are limited to 25% of the cost of the basic trend monitoring program. This investigative monitoring is intended to identify the parameter(s) causing water quality degradation, severity of the degradation, and the source of the pollution. Information from follow-up monitoring is intended to provide feedback to growers for management practice implementation to meet approved water quality objectives or eliminate the source of pollution. Examples of the type of follow-up monitoring under the current MRP include: source area evaluations, pesticide sampling in conjunction with toxicity sampling to determine likely cause of toxicity, and detailed evaluation of flow variability.

c. Stormwater Monitoring

This Monitoring component is not currently part of the existing CMP receiving water monitoring requirements but is proposed in some options as an enhancement.

Stormwater assessment is conducted twice during the rainy season. (October 15 – March 15). Rainy season sampling is conducted during or shortly after river runoff events, preferably including the first event that results in significant flow increase. Stormwater assessment is conducted for the following parameters, preferably in conjunction with already required wet season toxicity monitoring.

- Nutrients (mg/L)
  - measured –orthophosphate (as P), nitrate-nitrate (as N), total ammonia (as N)
  - calculated - unionized ammonia (as N)
- Oxygen (dissolved (mg/L) and percent saturation)
- Flow
- Turbidity (NTU)
- pH
- Total Dissolved Solids (mg/L)
- Conductivity (uS)
- Water Temperature (degrees C)
- Air Temperature (degrees C)

2. Individual discharge monitoring

This type of monitoring is generally intended to answer the question, "What is the quality of water and load of contaminants leaving this farm?" Individual discharge monitoring may include discharge characterization, surface discharge monitoring and groundwater monitoring. Individual discharge characterization (IDC) monitoring is a one time characterization of water quality in discharges leaving a farm operation. This monitoring provides an initial screening to determine if and how a farm operation will need individual

[2] The cooperative monitoring group can agree to fund or perform this monitoring on behalf of individual dischargers.

discharge monitoring. Individual surface discharge monitoring and Individual groundwater discharge monitoring are ongoing monitoring of farm discharges to assess compliance with the Order that are required if the IDC shows that these discharges are present.

a. Individual Discharge Characterization Monitoring

To establish the need for one time and/or continuous monitoring at an individual farm operation, farm operators/owners (Dischargers) would evaluate their farms individually by conducting an "individual discharge characterization" (IDC) of their farm operation. The IDC would require a farm operation to identify if they have non-stormwater discharge(s) to either surface or ground water. Examples of non-stormwater discharges include agriculture tailwater, tile drain water, pond water discharge, ponded furrows, and /or another intermittent agriculture water discharge.

If a farm operation has no identified non-stormwater discharge, that farm operation would not be required to conduct ongoing individual discharge monitoring. Each operation without an identified non-stormwater discharge would have the option to individually monitor stormwater and long-term in-stream trends or enroll in the Cooperative Monitoring Program for stormwater and long-term in-stream trends.

If a farm operation has an identified non-stormwater discharge to either surface or ground water, that discharge would have to sample and analyze for the following discharge characterization parameters:

Surface discharge:

- Flow
- Toxicity
- Total Nitrogen (mg/L)
- Nitrate-Nitrite (mg/L)
- Total Ammonia (mg/L)
- Ortho-Phosphosphate (mg/L)
- Turbidity (NTU)
- Water Temperature (degrees C)
- pH
- Total Dissolved Solids (mg/L)
- Un-ionized Ammonia (mg/L) (calculated)

Groundwater discharge:

- Nitrate-Nitrite (mg/L)
- Total Dissolved Solids (mg/L)

This information would be used to assess the potential impact from a discharge to surface and/or ground water. If the discharge characterization demonstrates the discharge has pollutants that exceed surface and/or ground water quality objectives, those pollutant discharges would then have to be treated to meet water quality objectives or the discharge must be eliminated, and further monitored, as discussed below to indicate subsequent changes in discharge quality.

b. Individual Discharge Monitoring

Individual Discharge Monitoring would be conducted by all or some Dischargers to document compliance with conditions of the Order. Dischargers would monitor to

document pollutant source, load reductions, and achievement with water quality objectives. Individual Discharge Monitoring would also be used to provide feedback to agriculturalists to address pollutants found in the individual discharge. Individual Discharge Monitoring information may also be used to direct additional implementation, monitoring, and reporting as necessary to address problems. Individual Discharge Monitoring data may be used to inform inspection and enforcement activities. This type of monitoring would be used to verify the adequacy and effectiveness of the Order's implementation at the individual farm operation.

All or some dischargers would have to monitor non-stormwater discharges to surface water. The non-stormwater discharge would have to be analyzed for the following parameters:

- Flow
- Toxicity
- Total Nitrogen (mg/L)
- Nitrate-Nitrite (mg/L)
- Total Ammonia (mg/L)
- Ortho-Phosphosphate (mg/L)
- Turbidity (NTU)
- Water Temperature (degrees C)
- pH
- Total Dissolved Solids (mg/L)
- Un-ionized Ammonia (mg/L)

This information would be used to assess the potential impact from a discharge to surface water and whether or not discharges meet water quality objectives or cause or contribute pollutant loading that causes surface water to exceed water quality objectives. The discharge would have to be monitored on an –on-going basis at an appropriate frequency, typically monthly or quarterly.

c. Individual Groundwater Monitoring

Some or all dischargers would have to monitor groundwater where discharges to groundwater are or may be occurring. The groundwater samples would have to be analyzed for the following parameters:

- Nitrate-Nitrite (mg/L)
- Total Dissolved Solids (mg/L)

The groundwater would have to be monitored at an appropriate frequency, typically quarterly for on-going groundwater quality characterization and to track changes and less frequently, such as annually, for simpler, broader characterization or indications of groundwater quality conditions.

d. Individual Stormwater Monitoring

A farm operation that has a stormwater discharge would have to monitor that discharge and analyze for the following parameters:

- Nutrients (mg/L)
  - measured –orthophosphate (as P), nitrate-nitrate (as N), total ammonia (as N)
  - calculated - unionized ammonia (as N)

- Oxygen (dissolved (mg/L) and percent saturation)
- Flow
- Turbidity (NTU)
- pH
- Total Dissolved Solids (mg/L)
- Conductivity (uS)
- Water Temperature (degrees C)
- Air Temperature (degrees C)
- Chemicals of concern (chlorpyrifos and/or diazinon if used at the farm/ranch, otherwise does not apply)

3. Individual Riparian and Wetland Photo-monitoring

This type of monitoring is generally intended to answer the question, "What is the extent and quality of riparian and wetland habitat on this farm?" Each farm operation with a watercourse, wetland, or waterbody would have to photo-document the physical conditions of existing water areas and associated riparian and wetland habitat. This information would help Water Board staff evaluate riparian and wetland habitat quality. Water Board staff would also be able to evaluate the potential riparian habitat to "buffer" or remove pollutants that might enter a watercourse.

Typically, riparian and wetland photo-monitoring is done in the first year a Discharger enrolls in the Order or within one year of adoption of a new Order. Those Dischargers that have operations that contain or are adjacent to a waterbody impaired for temperature or turbidity will conduct photo monitoring to document the condition of perennial, intermittent or ephemeral streams (wet or dry), riparian or wetland area habitat, and associated management practices implemented to prevent waste discharge and protect water quality. The photo monitoring must be repeated every three years.

Dischargers will conduct photo monitoring consistent with protocol established by the Executive Officer. Typically, there are multiple photo points at set intervals and each photo point is approximately forty feet away from the watercourse or waterbody, or from the outer edge of the riparian vegetation, whichever is greater. A point of reference is also included in the photo. The photos usually are accompanied by explanations and descriptions of the management practices demonstrated in the photos and include estimated widths of buffer areas from top of bank.

C. Monitoring Options Considered

In addition to reviewing the data and information from implementation of the existing MRP, Staff reviewed over 1260 comment letters submitted and oral comments at Water Board workshops in response to the February Preliminary Draft Order. Some of the major concerns related to a revised monitoring program were:

- Individual monitoring requirements (costly and time consuming)
- Individual monitoring data available to the public
- Inclusion of additional analytes
- Costs to conduct monitoring
- Costs to develop Quality Assurance Project Plans
- Impacts or unequal disadvantages to small or non-English speaking farmers

Water Board staff considered these public comments during the preparation and analysis the various monitoring options. Staff considered six monitoring options to address concerns raised during public comment, and the need for additional data related to:

- Ground water quality
- Riparian condition
- Source identification
- Source control

A comparison of the advantages and disadvantages of the six options considered is shown in **Table 2** below. A description of each option and its advantages and disadvantages is further described following the table.

Table 2: Advantages and Disadvantages of Monitoring Options

A "+" indicates feature is applicable for that option and is an advantage,
A "–" indicates it is applicable to the option and is a disadvantage
A blank means it is not applicable.

	1M	2M	3M	4M	5M	6M
Advantages						
Determines receiving water condition	+	+		+	+	+
Can be used to determine overall effectiveness of the Order	+	+		+	+	+
Tracks long term in-stream changes for water quality and beneficial use support	+	+		+	+	+
Determines spatial areas of in-stream impairment	+	+			+	+
Supports TMDL target monitoring	+	+		+	+	+
Directs management actions to areas of concern	+	+	+	+	+	+
Supports 303(d) listing and delisting	+	+		+	+	+
Assesses individual compliance with the conditions of the Order	+	+	+		+	+
Assesses groundwater quality		+	+		+	+
Assesses stormwater quality		+	+	+	+	+
Provides photo-data on wetland and riparian habitat		+	+		+	+
Can distinguish between types of surface water (tailwater, tile drain water, stormwater, etc)		+	+		+	+
Can identify individual agriculture operations discharge		+	+		+	+
Follow-up monitoring used to identify source areas, identify pollutants causing toxicity, etc.	+	+			+	
Monitoring costs are reflective of operation threat to water quality	+	+	+	+	+	+
Tiered structure places individual monitoring costs where					+	+

risk to water quality is highest						
Disadvantages						
Follow-up monitoring takes time to address known discharges with the potential to impact water quality	-				-	
Management and assessment of individual discharger data is complex		-	-		-	-
Complexity is high		-			-	
Cost is high		-			-	

1. Option 1M: Receiving Water Monitoring including Cooperative Monitoring and Follow-Up Monitoring, and Limited Individual Discharge Monitoring

This option includes receiving water monitoring and limited individual discharge monitoring. This option is derived from the existing MRP, Monitoring and Reporting Program No. R3-2004-0117.

Receiving Water Monitoring
The receiving water monitoring requirements in this option allow dischargers to monitor "cooperatively", and also conduct additional or "follow-up" monitoring cooperatively. If the discharger elects not to participate in the cooperative monitoring, they must undertake these program elements individually.

This option contains the following program components
- Trend monitoring
- Follow-up monitoring

These components are described in Sections B.1.a and B.1.b above. No modifications to these components are proposed.

Individual Discharge Monitoring
For this option, Individual discharge monitoring[1] may be elected by a Discharger or may be at the direction of the Water Board. Individual Discharge Monitoring will document water quality of the discharge as outlined in Section B.2.b above. Information from Individual Discharge Monitoring will be used to provide feedback to the farm operation to address pollutants found in the individual discharge. Individual Discharge Monitoring information may also be used to direct additional implementation, monitoring, and reporting as necessary to address problems.

Option 1M Advantages and Disadvantages
Advantages
- Determines receiving water condition
- Can be used to determine overall effectiveness of the Order
- Tracks long term in-stream changes for water quality and beneficial use support
- Determines spatial areas of in-stream impairment
- Supports TMDL target monitoring and listing and delisting decisions
- Directs management actions to areas of concern
- Assesses limited individual compliance

Disadvantages

- No comprehensive assessment of individual compliance
- No data on on-farm waste discharge controls or operational changes
- No groundwater monitoring data
- No riparian/wetland area monitoring

2. Option 2M: Individual Discharge Monitoring Including Individual Discharge Characterization, Receiving Water Monitoring (expanded), Including Cooperative Monitoring and Follow-up Monitoring, Groundwater Monitoring, and Riparian/Wetland Photo-monitoring

This option includes individual discharge monitoring and receiving water monitoring similar to Option 1M but with some key distinctions.

Receiving Water Monitoring
The receiving water monitoring requirements in this option allow dischargers to monitor "cooperatively", and also conduct additional or "follow-up" monitoring cooperatively. If the discharger elects not to participate in the cooperative monitoring, they must undertake these program elements individually. This option adds stormwater monitoring to the trend and follow-up monitoring components currently conducted by the CMP.

This option contains the following program components (described in Sections B.1.a, B.1.b, and B.1.c). No modifications to these components are proposed.

- Trend monitoring
- Follow-up monitoring
- Stormwater monitoring

Individual Discharge Monitoring
This option requires implementation of the following program components (described in Sections B.2.a, B.2.b, B.2.c, and B.3)

- Individual discharge characterization
- Individual surface discharge monitoring (but modified as described here)
- Individual riparian and wetland photo-monitoring
- Individual groundwater monitoring

Any individual discharge monitoring[1] is at the direction of the Water Board's Executive Officer. Individual agriculture operation discharge(s) identified through IDC and/or follow-up monitoring efforts as a source of pollution must be monitored. Individual Discharge Monitoring will document water quality of the discharge. Information from Individual Discharge Monitoring will be used to provide feedback to agriculturalists to address pollutants found in the individual discharge. Individual Discharge Monitoring information may also be used to direct additional implementation, monitoring, and reporting as necessary to address problems.

Option 2M Advantages and Disadvantages
Advantages

- Determines receiving water condition
- Can be used to determine adequacy and effectiveness of the Order
- Tracks long term in-stream changes for water quality and beneficial use support
- Determines spatial areas of in-stream impairment
- Supports TMDL target monitoring and listing and delisting decisions

- Directs management actions to areas of concern
- Assesses limited individual compliance
- Monitors for all discharge types (surface, ground, stormwater)
- Identifies pollution sources
- Assesses individual compliance with the Order

Disadvantages

- Many required monitoring actions
- Evaluation is complex and at many scales (point source, watershed, trend, groundwater infiltration, etc.)
- Data management and analysis is complex
- Complex and expensive

3. Option 3M: Individual Monitoring Only for all Dischargers, including Discharge Characterization, Surface Water, Groundwater, Stormwater, and Riparian/Wetland Monitoring

This option requires implementation of the following program components (described in Sections B.2.a, B.2.b, B.2.c, B.2.d, and B.3)

- Individual discharge characterization
- Individual surface discharge monitoring (but modified as described here)
- Individual groundwater monitoring
- Individual stormwater monitoring
- Individual riparian and wetland photo monitoring

Option 3M Advantages and Disadvantages

Advantages

- Directs management actions to individual discharges of concern
- Assesses individual compliance with the Order
- Identifies pollution sources
- Assesses individual compliance with the Order
- Monitors for all discharge types (surface, ground, stormwater)
- Assesses riparian habitat

Disadvantages

- No in-stream condition or beneficial use assessment
- No assessment of trends and overall program effectiveness at protecting water quality
- No tracking of compliance with TMDL monitoring requirements
- No data to support delisting of waters from the Impaired waterbody list

This option also provides information on individual stormwater discharge, riparian condition, groundwater condition, and management practice implementation.

4. Option 4M: Receiving Water Monitoring Program (expanded) for all Dischargers

The receiving water monitoring requirements in this option allow dischargers to monitor "cooperatively". If the discharger elects not to participate in the cooperative monitoring, they must undertake these program elements individually. This option is similar to option 1M, but does not include a Follow-up Monitoring component, or Individual Discharger Monitoring of any form.

This option contains the following program components (described in Sections B.1.a, and B.1.c). No modifications to these components are proposed.

- Trend monitoring
- Stormwater monitoring

Option 4M Advantages and Disadvantages

Advantages

- Determines receiving water condition
- Can be used to determine overall effectiveness of the Order
- Tracks long term in-stream changes for water quality and beneficial use support
- Provides data on in-stream stormwater quality
- Supports TMDL target monitoring and listing and delisting decisions
- Directs management actions to areas of concern

Disadvantages

- No assessment of individual compliance with the Order
- No data on on-farm waste discharge controls or operational changes
- No groundwater monitoring data
- No riparian/wetland area monitoring
- No capacity to provide better source area definitions, or track causes of toxicity

5. Option 5M: Cooperative Monitoring Program (expanded), Individual Surface Water Discharge Monitoring, Individual Groundwater Monitoring, and Riparian/Wetland Photo-monitoring

This option includes receiving water monitoring including stormwater, individual surface water discharge monitoring, individual groundwater monitoring, and Individual riparian and wetland photo-monitoring.

Receiving Water Monitoring

The receiving water monitoring requirements in this option allow dischargers to monitor "cooperatively". If the discharger elects not to participate in the cooperative monitoring, they must undertake these program elements individually. This option adds stormwater monitoring to the trend and follow-up monitoring components currently conducted by the CMP. This option contains the following program components (described in Sections B.1.a and B.1.c). No modifications to these components are proposed.

- Long-term trend monitoring
- Stormwater monitoring

Individual Discharge Monitoring

All individual monitoring components are modified from the components described in Section 2, except riparian and wetland photo-monitoring, which remains the same.

- Individual discharge prescreening (in lieu of Individual Discharge Characterization)
- Individual surface discharge monitoring (determined by prescreening Level described below)
- Individual groundwater monitoring (determined by groundwater quality Level described below)
- Individual riparian and wetland photo-monitoring

Individual Surface Water Discharge Monitoring – To determine the Individual Surface Water Discharge level of monitoring required, Dischargers will "prescreen" their farm operation to determine an "overall threat level." Prescreening is a "one time" assessment based on presence/absence of non-stormwater discharge to surface water, crop type, and use of chemicals of chemicals of concern (diazanon, chlorpyrifos, pyrethroids, or other chemical of concern as identified by the Water Board Executive Officer). The prescreening will "rate" an operation as a Level 1S, 2S, 3S, or 4S surface water discharge. Below is a summary of the discharge monitoring requirements for each Surface Water Discharge Monitoring level during the first year of the Order:

Level 1S (No surface water discharge)

- No discharge monitoring

Level 2S (Surface water discharge)

- Discharge Monitoring
  - Two sample events
  - Flow measured or calculated in gallons per day for both sampling events
  - All samples collected during each event evaluated for:
    - Nitrate (NO_3) as nitrogen mg/L
    - Clarity evaluate with clarity tube

Level 3S (Surface water discharge)

- Discharge Monitoring
  - Four sample events
  - Flow measured or calculated in gallons per day for both sampling events
  - All samples collected during each event evaluated for:
    - Nitrate (NO_3) as nitrogen mg/L
    - Clarity evaluate with clarity tube
  - Two samples evaluated for chemicals of concern

Level 4S (Surface water discharge)

- Discharge Monitoring
  - Four sample events
  - Flow measured or calculated in gallons per day for both sampling events
  - All samples collected during each event evaluated for:
    - Nitrate (NO_3) as nitrogen mg/L
    - Clarity evaluate with clarity tube
  - Two samples evaluated for chemicals of concern and measure for toxicity as directed by the Water Board Executive Officer

At the end of one year of sampling, Dischargers will reassess a farm operations overall threat level, referred to as the "Operation Level." The reassessment is water quality based and is determined based on the presence/absence of non-stormwater discharge, use of chemicals of concern, and the single highest surface water and groundwater sample with high nitrate concentration. Farm operations must use farm operation specific information to classify a farm operation. Dischargers will use water quality data from their operation and the flow chart below (Figure 1 page 42) to reassess a farm operations overall threat level.

Individual Groundwater Monitoring – The level of individual groundwater monitoring required is based on existing groundwater quality. A farm operation over a groundwater basin with nitrate at 10mg/L or less will be classified as level 1G. A farm operation over a groundwater basin with nitrate greater than10mg/L will be classified as level 2G. Below is a summary of the discharge monitoring requirements for each Groundwater Monitoring level:

Level 1G

- Participation in CMPA
- Groundwater monitoring

Level 2G

- Participation in CMP
- Groundwater monitoring
- Discharge Monitoring
    - Flow measured or calculated in gallons per day
    - Nitrate concentration measured mg/L
    - Clarity evaluate with clarity tube

Groundwater must be monitored at wells located on the farm operation. This information will help Water Board staff evaluate groundwater quality.

Individual Riparian and Wetland Monitoring - Each farm operation with a watercourse, wetland or waterbody will photo document the physical conditions of existing water areas and associated riparian habitat. This information will help Water Board staff evaluate riparian habitat quality.

The combined monitoring requirements for each operation level are:

Level 1S

- Participation in CMP
- Groundwater monitoring
- Aquatic habitat protection monitoring

Level 2S

- Participation in CMP
- Discharge Monitoring
    - Flow measured or calculated in gallons per day
    - Nitrate concentration measured
    - Clarity evaluate with clarity tube
- Groundwater monitoring
- Aquatic habitat protection monitoring

Level 3

- Participation in CMP
- Discharge Monitoring
    - Flow measured or calculated in gallons per day
    - Nitrate concentration measured
    - Clarity evaluate with clarity tube
- Groundwater monitoring

- Aquatic habitat protection monitoring

Level 4
- Participation in CMP
- Discharge Monitoring
  - Flow measured or calculated in gallons per day
  - Nitrate concentration measured mg/L
  - Clarity measure turbidity NTUs
- Groundwater monitoring
- Aquatic habitat protection monitoring

Option 5M Advantages and Disadvantages

Advantages
- Determines receiving water condition
- Can be used to determine adequacy and effectiveness of the Order
- Tracks long term in-stream changes for water quality and beneficial use support
- Determines spatial areas of in-stream impairment
- Supports TMDL target monitoring and listing and delisting decisions
- Directs management actions to areas of concern
- Assesses limited individual compliance
- Monitors for all discharge types (surface, ground, stormwater)
- Identifies pollution sources
- Assesses individual compliance with the Order
- Tiered structure places individual monitoring costs where risk to water quality is highest

Disadvantages
- Many required monitoring actions
- Evaluation is complex and at many scales (point source, watershed, trend, groundwater infiltration, etc.)
- Data management and analysis is complex
- Complex and expensive

6. Option 6M: Cooperative Monitoring Program (expanded), Tiered Individual Monitoring (Surface Water Discharge, Groundwater, and Individual Riparian and Wetland Habitat Protection)

This option includes receiving water monitoring, individual surface water discharge monitoring, individual groundwater monitoring, and Individual riparian and wetland photo-monitoring.

Receiving Water Monitoring

This option adds stormwater monitoring to the trend monitoring component of the CMP, and eliminates follow-up monitoring as currently conducted by the CMP. The receiving water monitoring requirements in this option allow dischargers to monitor "cooperatively", and also conduct stormwater monitoring cooperatively. If the discharger elects not to participate in the cooperative monitoring, they must undertake these program elements individually.

This option contains the following program components (described in Sections B.1.a and B.1.c). No modifications to these components are proposed.
- Trend monitoring

- Stormwater monitoring

Individual Discharge Monitoring

Operations are tiered based on threat to water quality. Surface water discharge monitoring is required only for highest tier dischargers and has been simplified significantly from the basic description of this component in Section B.2.b. Groundwater monitoring and riparian and wetland photo-monitoring remained as described in Sections B.2.c and B.3, but are only required in certain tiers based on threat.

- Operations are assigned tiers based on threat to water quality is determined Tiered Individual surface water monitoring (described below)
- Tiered Individual groundwater monitoring
- Tiered Individual riparian and wetland photo-monitoring

Tiered Individual Monitoring (Surface Water Discharge, Groundwater, and Individual Riparian and Wetland Habitat Protection) – Individual Monitoring has three tiers. Tier 1, applies to Dischargers who appear to discharge the lowest level of waste or pose the least threat. The highest tier, Tier 3, applies to Dischargers who appear to discharge the highest level of waste or pose the greatest threat. Tier 1 Dischargers have the least amount of individual monitoring and Tier 3 Dischargers have the greatest amount of individual monitoring.

To determine the level of individual monitoring required Dischargers will evaluate their farm operation to determine overall threat to water quality. The threat to water quality is based on the size of an operation, use of chemicals of chemicals of concern (diazinon, chlorpyrifos, or other chemical of concern as identified by the Water Board Executive Officer), proximity of a farm operation to an impaired waterbody, and Nitrate Hazard index for a particular crop type. Below is a summary of the discharge monitoring requirements for each monitoring Tier:

Tier 1

- Receiving water monitoring
- Groundwater monitoring

Tier 2

- Receiving water monitoring
- Individual groundwater monitoring
- Individual riparian and wetland photo-monitoring

Tier 3

- Receiving water monitoring
- Individual groundwater monitoring
- Individual riparian and weland photo-monitoring
- Individual surface water discharge monitoring
    - Flow measured or calculated in gallons per day
    - Nitrate concentration measured mg/L
    - Clarity measure turbidity NTUs

All Tiers conduct receiving water and groundwater monitoring. Tier 2 and Tier 3 Dischargers must also conduct individual wetland and riparian photo-monitoring if the farm operation has a watercourse or wetland. Only Tier 3 Dischargers must conduct surface water discharge monitoring.

Staff evaluated whether all dischargers in Tier 2 and 3 should conduct photo-monitoring and determined to confine this monitoring requirement to only those adjacent to streams already degraded for pollutants or impairments that benefit most from riparian and wetland habitat as a buffer or from installed vegetative buffers. Those pollutants or impairments include sediment, turbidity and temperature. Staff considered requiring photo-monitoring of riparian and wetland areas for operations adjacent to waterbodies impaired by pesticides and toxicity as well but decided against it.

While evidence of vegetated buffer areas would indicate protection of beneficial uses and reduce pollutant loading, as a pollution control practice vegetated systems are most effective for reducing pollutant loading for pesticides that attach to sediments and less effective at reducing pesticides that are most soluble in water. Since most of the toxicity and pesticide impairments in agricultural areas of the region are from water soluble pesticides, the measure widely applied would have limited benefit addressing pesticide loading and its greatest benefit controlling sediment-related impairments. However, any buffers installed are likely to improve beneficial use protection related to some level of pesticide removal either by filtering sediments with pesticides attached or by slowing of runoff water or infiltration that reduces flow of water with pesticides in it.

At the end of one year of sampling, higher threat Dischargers have the option to reassess a farm operation's overall threat level. The reassessment is water quality based and is determined based on the presence/absence of non-stormwater discharge, use of chemicals of concern, and the single highest surface water and groundwater sample with high nitrate concentration.

Option 6M Advantages and Disadvantages

Advantages

- Determines receiving water condition
- Can be used to determine adequacy and effectiveness of the Order
- Tracks long term in-stream changes for water quality and beneficial use support
- Determines spatial areas of in-stream impairment
- Supports TMDL target monitoring and listing and delisting decisions
- Directs management actions to areas of concern
- Assesses individual compliance
- Monitors for all discharge types (surface, ground, stormwater)
- Identifies pollution sources
- Assesses individual compliance with the Order
- Tiered structure places individual monitoring costs where risk to water quality is highest
- Provides tiered individual monitoring with less complexity that Option 5M.

Disadvantages

- Moderately more complex than some options
- Data management complexity

D. Recommendation

Water Board staff recommends **Option 6M**. This option prioritizes high threat Dischargers and requires discharge monitoring from these farm operations. This option requires high and medium threat Dischargers to conduct individual Riparian and Wetland Habitat

Protection Monitoring. This option also requires all dischargers to conduct receiving water monitoring to retain capability to assess status and trends in receiving waters. This option also requires all dischargers to conduct groundwater monitoring for general characterization purposes. This combination of the types of monitoring, assigned to dischargers based on threats to water quality, will be the most effective for the Water Board and the public to determine if water quality and beneficial uses are protected, the Order is effective and dischargers are complying with the conditions of the Order. This fulfills the Water Boards obligation, pursuant to the California Water Code, to include monitoring for a Conditional Waivers of Waste Discharge Requirements. Furthermore, the information generated from these combined monitoring efforts will allow Water Board staff to focus management actions on significant discharges with the greatest potential to impact water quality and associated beneficial uses. Water Board staff will also improve understanding of the water quality conditions from agricultural discharges and discharger's implementation in all areas of the region. Water Board Staff will be more likely to direct, track and order changes in implementation to decrease pollutants discharged and thereby improving water quality and associated beneficial uses.

III. Reporting Options

Water Board staff has considered various reporting options to address concerns raised during public comment and the need for additional data to determine compliance and the protection of water quality and associated beneficial uses. Board Staff considered three reporting components: type of Information reported, amount of information reported, and methods of reporting. The type of Information reported (e.g. management practice tracking, water quality data, etc.) and frequency of information reported are discussed in Section 1 with respect to the 2004 Order or proposed Orders. The methods of reporting are discussed in Section 2 independent of a specific Order.

1. Type and Quantity of Reporting

The information that must be reported varies according to conditions of an Order and the accompanying monitoring and reporting program. The discussion below uses the reporting associated with the 2004 Order, the proposed February Preliminary Draft Order, and the Draft November 2010 Order as examples to highlight the variation in reporting options.

Existing 2004 Order
The 2004 Conditional Waiver Order has specific reporting requirements for two tiers. For each tier, dischargers are required to provide information to the Water Board on farm plan completion, education completion, and management practice implementation.

For Tier 1 (five-year) waivers, dischargers submit a completed Management Practice Checklist with identified implemented and planned management practices two and a half years after adoption of the Order.

For Tier 2 (one-year) waivers, dischargers submit an annual report identifying actions taken to complete education and implementation plan requirements, including certification of attendance at Regional Board approved education courses and statement of farm water quality plan completion if applicable. Tier 2 waivers also submit a completed Management

Practice Checklist that identifies currently implemented and planned management practices.

Independent of the tiers, in-stream surface water monitoring reports must be submitted annually. As developed, the reporting program allows for either the discharger or a cooperative monitoring group to submit the monitoring reports to the Water Board. The reporting program only requires that in-stream water quality information be submitted. Under 2004 Order, all of the in-stream data reporting is submitted by a cooperative monitoring group.

For 2004 Order, the type and frequency of individual reporting for all dischargers is minimal. The Order requires Tier 1 dischargers to submit the management practice checklist once during the five-year term and requires Tier 2 dischargers to submit the report annually. Moreover, the quantity of individual reporting for all dischargers is also minimal. All reports require only a management practice checklist and a summary of implemented and planned management practices.

February 2010 Preliminary Draft Conditional Waiver Order

The February 2010 Preliminary Draft Order has reporting requirements for all dischargers. Although not specifically stated, the Order includes a low risk tier and a second tier for all other dischargers. The "Low-Risk Tier" designation makes low-risk discharges low priority and minimizes reporting associated with these dischargers. However, for all other discharges reporting is substantial.

For all other reporting requirements, the February 2010 Preliminary Draft Order does not distinguish between Tier 1 and Tier 2 dischargers. Below is a partial list of the reporting requirements for all dischargers:

- Submit Notice of Intent
- Submit Annual Acreage Update
- Submit Quality Assurance Project Plan and Sampling and Analysis Plan
- Submit groundwater well location and construction information
- Submit Monitoring Reports (Quarterly)

The frequency of individual reporting varies from immediately for items like the notice of intent, to quarterly for water quality data, and annually for acreage updates. The February 2010 Preliminary Draft Order requires water quality data reporting for surface water (discharge and stormwater), groundwater, and aquatic (riparian) habitat. The reporting program allows for either the discharger or a cooperative monitoring group to submit the monitoring reports to the Water Board.

For this Order, the quantity of individual reporting for all dischargers is also significant. Although a cooperative monitoring group currently performs the in-stream reporting, there is no similar reporting structure for individual surface water discharge, groundwater, and aquatic habitat reporting. Under this Order, each discharger would be responsible for reporting information associated with monitoring of surface water discharge, groundwater, and aquatic habitat. As proposed, monitoring reports must be submitted quarterly. Although the cooperative monitoring group does not manage the surface water discharge, groundwater, and aquatic habitat information, the February 2010 Preliminary Draft Order includes options for individual reporting and/or cooperative reporting. Furthermore, this Order would require all dischargers to document details on management practice

implementation and effectiveness, demonstrate that pollutants in discharge have been reduced or eliminated to meet water quality standards. This information is to be reported in Farm Plans and the Order specifies some of the record keeping required to support the reported status.

Draft Order released in November 2010

The Draft November 2010 Draft Order has specific reporting requirements for three tiers. For each tier, dischargers are required to provide specific information to the Water Board. Below is a partial list of the reporting requirements for all dischargers:

Reporting Requirements for All Dischargers (Tier 1, Tier 2 and Tier 3):

1. Receiving Water Quality Reporting;
2. Groundwater Reporting

Reporting Requirements for Tier 2 and Tier 3 Dischargers:

3. Annual Compliance Document Reporting;
4. Photo Monitoring Reporting

Additional Monitoring and Reporting Requirements for Tier 3 Dischargers:

5. Individual Discharge Monitoring and Reporting;
6. Nitrate Loading Risk Level Reporting;
7. Irrigation and Nutrient Management Plan (required for subset of Tier 3 Dischargers if discharge has High Nitrate Loading Risk);
8. Water Quality Buffer Plan (required for subset of Tier 3 Dischargers that have operations that contain or are adjacent to waterbody impaired for temperature or turbidity)

Tier 1

As proposed, frequency and amount of reporting for Tier 1 dischargers is minimal. Tier 1 dischargers must provide annual receiving water quality reporting. Receiving water quality reporting is currently managed by the cooperative monitoring group and it is projected that this would continue under the November 2010 Draft Order. Within two years, Tier 1 individuals would be responsible for “one time” groundwater reporting regarding the quality, location and number of groundwater wells located at their specific agricultural operations. Although Tier 1 dischargers are not required to submit an Annual Compliance Document, they will develop, implement, and annually-update Farm Water Quality Management Plans.

Tier 2

Reporting for all Tier 2 dischargers identified in this November 2010 Draft Order is more significant. The frequency of reporting for Tier 2 is annually, but there are more reports with additional information required. All Tier 2 dischargers must provide the annual receiving water quality reporting and the one time groundwater reporting consistent with Tier 1 dischargers. Additionally, Tier 2 dischargers must provide annual compliance documents that include status of implementation and results of photo monitoring reporting. The Draft Order requires the following types of information for tracking implementation: For example, identification of specific farm water quality management practices completed, in progress, and planned to address water quality impacts caused by discharges; Information describing individual operations (e.g., crop type, acreage, irrigation type, containment structures). The Annual Compliance Document provides information to the Water Board to inform the evaluation of threat to water quality from individual agricultural discharges, to measure progress and verify compliance with the Order and MRP.

Tier 3

Reporting for all Tier 3 dischargers identified in the November 2010 Draft Order is significant. The frequency of reporting for Tier 3 is typically annually and there are some reports that are reported once within the five year period of the Order. However, there are also more reports and the reports require additional and different information.

Tier 3 dischargers must provide the annual receiving water quality reporting and the one time groundwater reporting consistent with Tier 1 dischargers. Tier 3 dischargers must also provide annual groundwater reporting.

Tier 3 dischargers must provide annual compliance documents that include status of implementation and results of photo monitoring reporting consistent with Tier 2 dischargers. Additionally, Tier 3 dischargers must include nitrate loading risk information when submitting the annual compliance document report. The annual compliance document must also include information that demonstrates that pollutants in discharge have been reduced or eliminated to meet water quality standards in receiving waters or other specified loading targets by certain dates, depending on the pollutant. For example, dischargers must submit information on their contribution to turbidity conditions in receiving water and show that the discharge is not contributing within three years. Also, dischargers must submit information on their reduction of nitrate loading to groundwater, consistent with loading targets, with five years.

Tier 3 dischargers must also submit reports that document individual discharge monitoring. Within two years of adoption of the Order or enrollment, Tier 3 dischargers must submit an individual discharge monitoring data report and an individual discharge monitoring annual report. The individual discharge monitoring individual discharge monitoring data report must be submitted annually thereafter.

Also, within four years of the adoption of this Order, for a subset of Tier 3 dischargers that contain or are adjacent to a waterbody impaired for temperature or turbidity, these dischargers must submit a Water Quality Buffer Plan. The Water Quality Buffer Plan shall be developed to prevent waste discharge, comply with water quality standards (e.g., temperature, turbidity), and protect beneficial uses.

Tables 3 and 4 below summarize the types of reports and the frequency of those reports that must be submitted for the various Orders. There are several differences between the reporting in the 2004 Order and the reporting in the Draft Orders. One significant difference between the 2004 Order and the November 2010 Draft Order are the individual operation's discharge reporting requirements. Additionally, the 2004 Order requires all tracking of implementation to be retained in the farm plan on the farm. The February 2010 Preliminary Draft Order proposed implementation tracking to be documented in the farm plan and submittal of the farm plan to the Water Board. The November 2010 Draft Order proposes tracking of implementation in the farm plan and that the farm plan is kept on the farm. The November 2010 Draft Order also proposes an annual compliance document to be submitted with documentation of management practice implementation status and implementation verification.

Since the 2004 Order does not require individual discharge monitoring, Water Board staff must rely on in-stream data to determine changes in water quality. To focus Water Board efforts on pollution load reduction, it is necessary to know where the pollution is entering the

water body and characteristics of the pollutants in the discharge. The individual discharge reporting information will provide Water Board staff with information to determine sources of pollution and promote compliance with an Order.

Other significant differences are the groundwater, stormwater, and riparian and wetland photo-monitoring reporting. Similar to the discharge reporting, these types of data are necessary for determining compliance with water quality objectives.

The implementation of an Order to protect water quality and document compliance with California law requires evaluation of more than in-stream water quality and tracking of management practices. Management practice implementation without on farm data to evaluate the effectiveness of management practices, does not provide conclusive information to a landowner that the practices are protective of water quality.

Table 3: Types of Individual and Group Reports

Order	NOI	MP Checklist	BMP Tracking	Farm Plan	Compliance Documents	WQ In-stream*	Discharge	Storm Water*	Riparian	Ground Water
Existing										
Tier 1	Y	Y	Y	Y	N	Y	N	N	N	N
Tier 2	Y	Y	Y	Y	N	Y	N	N	N	N
Feb Order										
Tier 1	Y	Y	Y	Y	N	Y	N	N	N	Y
Tier 2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Nov Order										
Tier 1	Y	N	N	Y	N	Y	N	Y	N	Y
Tier 2	Y	N	Y	Y	Y	Y	N	Y	Y	Y
Tier 3	Y	N	Y	Y	Y	Y	Y	Y	Y	Y

* In-stream and stormwater may be conducted through group sampling (CMP)

Table 4: Frequency of Individual Reporting

Order	Immediate	Quarterly	Year 1	Year 2	Year 3	Year 4	Year 5
Existing							
Tier 1	Y	N	N	Y	N	N	N
Tier 2	Y	N	Y	Y	Y	Y	Y
Feb Order							
Tier 1	Y	N	N	Y	N	N	N
Tier 2	Y	Y	Y	Y	Y	Y	Y
Nov Order							
Tier 1	Y	N	Y	N	N	N	N
Tier 2	Y	N	Y	Y	Y	Y	Y
Tier 3	Y	N	Y	Y	Y	Y	Y

2. Methods of Reporting

Water Board staff considered three general methods of reporting and incorporated a delayed delivery of the information collected as shown in the options below. The three general methods of reporting are:

- Individual - individuals collect information and report to Water Board.
- Individual/Group - a third party collects information for individuals and reports to Water Board for each individual.
- Group - a third party collects information for individuals and reports to Water Board as a group.

The selection of particular method of reporting reflects time for compliance and sensitivity to proprietary information. In all cases, the method of reporting selected will provide the Water Board with sufficient information to determine the adequacy and effectiveness of the waiver's conditions. Options considered are summarized below:

Option 1R: Individual Reporting
All non-storm surface water and groundwater information will be reported by each discharger. Each discharger will report on in-stream water quality. Each discharger will report on stormwater quality. All reporting to the Water Board will be on a predetermined time schedule.

Option 2R: Individual Reporting Delayed
All non-storm surface water and groundwater information will be reported by each discharger. Each discharger will report on in-stream water quality. Each discharger will report on stormwater quality. All reporting to the Water Board will be on a predetermined time schedule. Reporting to the Water Board will be delayed 18 months. Dischargers will report at 18 months to document that non-stormwater discharge meets conditions of the Order or document non-stormwater discharge has been eliminated. If non-stormwater discharge has been eliminated, then non-stormwater discharge water quality data collected does not need to be reported.

Dischargers must report at 18 months to document stormwater water quality. Dischargers must report at 18 months to document in-stream water quality.

Option 3R: Individual/Group Reporting
All riparian, non-storm surface water and groundwater information will be reported by each discharger. A Third Party will report stormwater and in-stream water quality information for the dischargers. Each discharger and the Third Party will report information to the Water Board on a predetermined time schedule.

Option 4R: Individual/Group Reporting Delayed
All riparian, non-storm surface water and groundwater information will be reported by each discharger. A Third Party will report stormwater and in-stream water quality information for the dischargers. Each discharger and the Third Party will report information to the Water Board on a predetermined time schedule.

Individual dischargers may delay riparian, non-storm surface water and groundwater discharge information reporting to the Water Board for 18 months. Dischargers will report at 18 months to document that non-stormwater discharge meets conditions of the Order or document non-stormwater discharge has been eliminated. If non-stormwater discharge has been eliminated, then non-stormwater discharge water quality data collected does not need to be reported. A Third Party will not delay reports and will document in-stream water and stormwater quality on a predetermined time schedule.

Option 5R: Group Reporting

All non-storm surface water, in-stream, stormwater, riparian, and groundwater information will be collected and reported by a Third Party. A Third Party will report information for the dischargers collectively to the Water Board on a predetermined time schedule. The collective information will be reported as follows:

- Number of farm operations sampled
- Number of discharge samples collected
- Number of groundwater wells
- Number of d groundwater samples collected
- Report surface water data by waterbody and sub-watershed
- Number of farm operations contributing to a waterbody and/or sub-watershed
- Report groundwater data by groundwater basin
- Number of farm operations contributing to a groundwater basin
- Report data range (high, low, average, and median)
- Coded locations of farm operations in compliance
- Decoded locations of farm operations out of compliance

Option 6R: Group Reporting Delayed

All non-storm surface water, in-stream, stormwater, riparian, and groundwater information will be collected and reported by a Third Party. A Third Party will report on dischargers collectively to the Water Board after 18 months. A Third Party will report at 18 months to document non-stormwater discharge from dischargers meet conditions of the Order or document non-stormwater discharge for a group of dischargers has been eliminated. If non-stormwater discharge has been eliminated, then non-stormwater discharge water quality data collected from those dischargers does not need to be reported. The collective information will be reported as follows:

- Number of farm operations sampled
- Number of discharge samples collected
- Number of groundwater wells
- Number of d groundwater samples collected
- Report surface water data by waterbody and sub-watershed
- Number of farm operations contributing to a waterbody and/or sub-watershed
- Report groundwater data by groundwater basin
- Number of farm operations contributing to a groundwater basin
- Report data range (high, low, average, and median)
- Coded locations of farm operations
- Farm operation data linked to code in month 18 if data shows continued discharge in excess of water quality objectives.
- Decoded locations of farm operations out of compliance

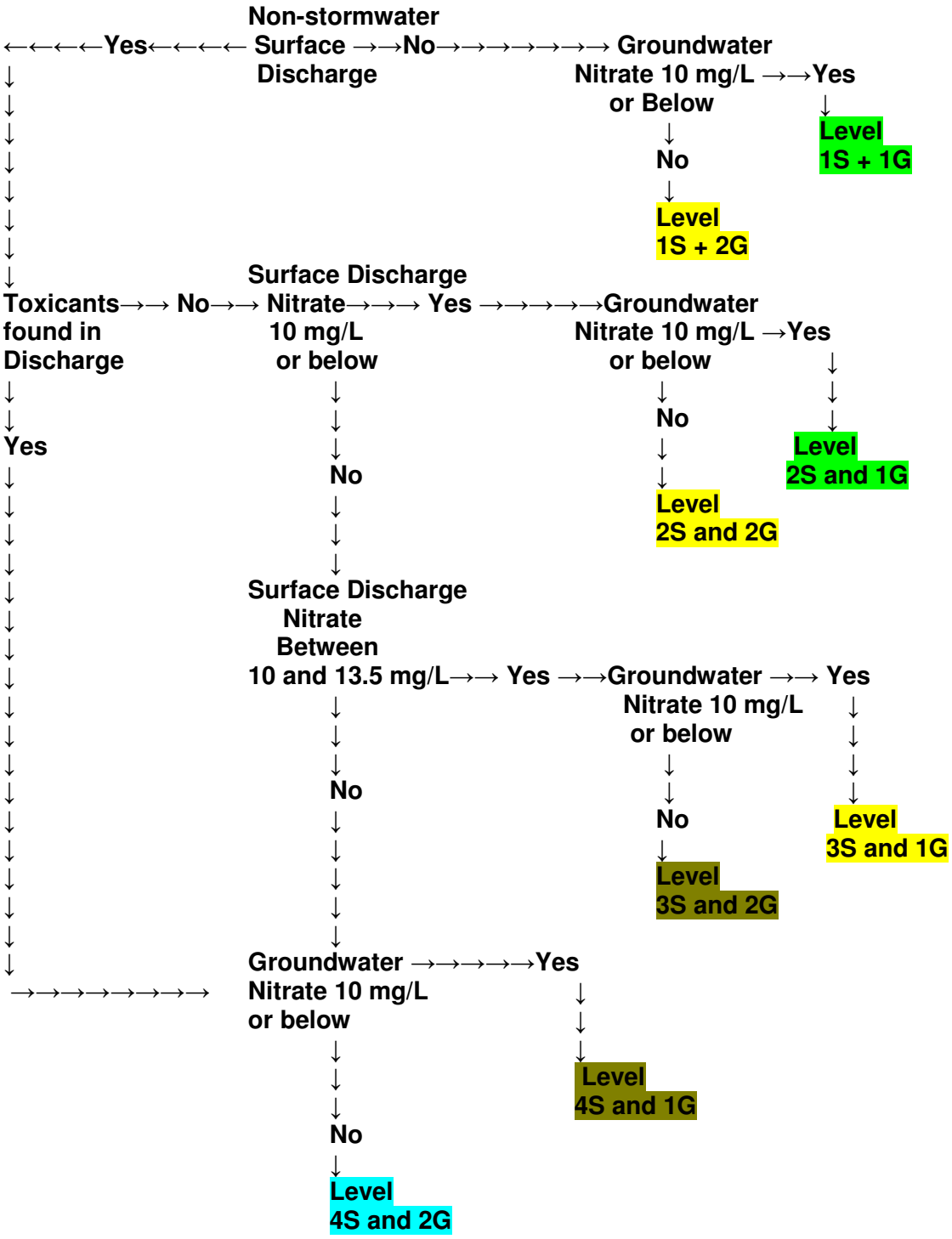
In-stream water and stormwater quality reporting would be through a cooperative monitoring program and be conducted by a Third Party. In-stream water and stormwater quality reporting would be on a predetermined time schedule.

Reporting is the responsibility of all Dischargers, either individually or collectively, and they must comply with the requirements of the Board-approved Monitoring and Reporting Program.

3. Recommendation

Staff recommends **Option 3R** plus the information described above for the November 2010 Draft Order. With this option, the *type* of information required is comprehensive, including specific status of implementation, and data to characterize receiving water conditions, surface water discharges, groundwater loading, and riparian and wetland habitat's protective function for direct discharges to streams or wetlands. The *amount* of information is moderate compared to the other options, as the 2004 Order requires a very limited amount of information and the February 2010 Preliminary Draft Order proposed a lot of information be reported by most dischargers. Additionally, this option requires a different amount of information for the different tiers so that the lowest threat dischargers continue to have minimal reporting requirements and only the highest threat dischargers are required to submit a significant amount of information. The *method* of reporting in Option 3R includes reporting by both individual dischargers and a Third Party on discharger's behalf. This provides some flexibility and economies of scale to dischargers. This option likely provides the most manageable workload for Water Board staff. This option will support collection of adequate type and amount of information to inform implementation and water quality improvement and help determine compliance and enforce where necessary.

Figure 1 – Operation Level Flow Chart



IV. Options for Management Practices or Other Discharge Controls

INTRODUCTION

Staff considered the following options when developing the conditions included in the Ag November 2010 Draft Order. This section discusses some of the constraints and opportunities available to the agricultural operators in controlling discharges.

Staff analyzed and considered management practices currently available, practices that are currently being implemented, and other practices or measures that could be further developed and optimized to be implemented by the agricultural operators, to control both the type and the amount of pollutants discharged to surface waterbodies and groundwater.

Management practices (MPs) can be grouped into three categories: 1) source control practices that control the discharge at the source, by minimizing the amount of pollutant available for discharge or by stopping the movement of the pollutant from the land application to waters of the state, 2) water treatment which includes practices and systems intended to remove the pollutant before the water moves outside the limits of the agricultural operation, and 3) changes in operations such as switching the use of certain higher risk chemicals that are impairing water resources to those with lower risk properties, e.g., highly biodegradable, that generally lower their potential to impair water quality.

1) Source control - From an economical point of view, the practices that control pollution at its source may represent a potential monetary savings to the agricultural operator due to a reduction in the amounts of chemical used (e.g., fertilizers and pesticides), and therefore a reduction in the amounts of wastes generated that could be discharged (e.g., drainage or runoff of excessive, inefficient applications of irrigation water). Source control of pollutants is an excellent tool for managing chemicals such as pesticides that persist in the environment. Source control practices also represent a net savings in valuable and limited water resources, such as groundwater, and in energy needed to produce and apply a chemical.

2) Water treatment - Treatment type practices and technologies are a valid tool for agricultural operations where source control practices cannot completely control the discharges for example where the local conditions and constraints make it difficult to effectively control all discharges: such as when chemicals/pollutants are already in irrigation water e.g., nitrate).

3) Change or switch the chemicals that are being applied - Agricultural operators have the option to stop using chemicals known to impair water quality and use more environmentally-friendly products, such as organic products, or products with lower potential to impair waters, such as biopesticides (http://www.epa.gov/oppbppd1/biopesticides/index.htm) and reduced risk pesticides (http://www.epa.gov/opprd001/workplan/reducedrisk.html).

REDUCING AND/OR CONTROLLING DISCHARGES TO SURFACE WATERS

Reducing Nutrient Concentrations in Surface Water Discharges

Irrigation Efficiency and Treatment - The amount of irrigation runoff outside the limits of the agricultural operation can often be minimized by improving irrigation efficiency. Efficient application of irrigation water minimizes the transport of pollutants from the land to surface water and groundwater by reducing water losses. Irrigation runoff occurs when: a) the application rate of an irrigation system exceeds the infiltration rate of the soil, b) low irrigation efficiencies, c) low soil permeability, and d) physical (textural and structural) land constraining properties. In some exceptional cases, water losses occur at the pump station when the volume of water pumped from groundwater exceeds the amount of water that the irrigation system can deliver to the field.

a) Growers can select an irrigation system that applies water at a rate according to the soil intake rate, which is a common problem with sprinkler systems, and re-grade the slope to minimize runoff and increase water infiltration.

b) Low irrigation efficiencies result in water being unevenly disbursed across an agriculture operation. Uneven distribution may increase the number of irrigation applications needed to provide water to those areas that are typically "underwatered." This form of inefficient irrigation management may increase pumping duration, create "overwatered" areas, and may result in a discharge. Low irrigation efficiencies can also occur by applying water when the soil profile is still wet or for long periods of time.

c) Low soil permeability and/or water infiltration rate (also known as intake rate), may be a result of chemical constraints (both from water chemistry and from soil chemistry) or physical constraints, related to the soil such as crusting formation, high silt content, lack of soil profile structure, and/or poor soil aggregation.

d) Soil and land physical (textural and structural) properties can play a major role in reducing the soil infiltration rates. Growers can implement management practices to protect the soil and land from degradation by returning organic matter to the soil and keeping the soil surface covered to protect it from erosive forces. Where soil and land limitations are extreme (those with high erosion hazard), growers should consider whether the practices and measures needed to be implemented on this land to protect the soil from degrading and protecting water quality, are economically feasible and/or can interfere with other farming operations.

When irrigation water is captured, it can be treated to remove all pollutants dissolved and in suspension in the water. Staff reviewed literature regarding treatments available to growers for reducing the nutrient concentration in irrigation runoff, irrigation deep percolation, and stormwater infiltration to comply with the Basin Plan requirements.

Reducing Pesticides Toxicity in Surface Water Discharges

Staff found a series of options for treating and/or eliminating pesticide compounds from irrigation water runoff. These options could filter, remove toxic components by using wastewater treatment technologies, or enhance the eutrophication and degradation of toxic molecules at the farm level by constructing small on-farm ecosystems (such as

wetlands). Staff also asked for input regarding pesticide regulation from other agencies (see Attachment A to this document).

Option 1IR - Each individual grower, who releases polluted irrigation runoff must capture it, store it in moving tanks, and transport it in vehicles to the closest wastewater treatment plant for appropriate treatment.

Option 2IR – Each individual grower who releases polluted irrigation runoff must treat it on-site by using Granular Activated Carbon filters, ozonation, and/or equivalent processes that have shown to effectively break down and eliminate the specific pesticide compounds.

Option 3IR – Each individual grower who releases polluted irrigation runoff must capture it in manmade ponds, reservoirs, or catchment basins, with appropriate impermeable lining, and hold it on-site during the minimum length of "time" to settle all sediments out of solution and to break down all the pesticide molecules. The pesticides will be treated by natural processes such as bacteria degradation, sunlight, hydrolysis, and/or chemical reactions. Other forms of natural treatments that could be used to enhance the processes include grasses planted on ditches, waterways, filter strips, and catchment basins.

Option 4IR – Polluted irrigation runoff can be treat on-site by running the water thru a V ditch Vegetative Treatment System (VTS), a vegetated wetlands, or equivalent, with the specifications described below, or equivalent system that achieves pesticide and toxicity reductions in compliance with the limits in the Basin Plan. The VTS must be coupled with the use of other products known to reduce pesticides from solution and/or sediments in suspension. The V ditch should be at least 10 ft wide at top and 3 ft wide at bottom, with approximately 1 ft gradient to ensure slow water moving down the system. The VTS should include a 100 ft or longer sediment settling area, a weir to slow water down; water resident time of at least 1 hour; a 700 ft or longer vegetated area covered with Bermuda grass covering 100% of the lower ditch banks and channel, or equivalent species that achieves the same reductions; water resident time of at least 3 hours; a dosing flume, or equivalent injection equipment with Landguard application, or equivalent enzyme that achieves the same reductions. Adding Polyacrylamide (PAM), a synthetic high molecular weight organic polymer, to the process might be an alternative to reduce/eliminate sediments and pesticides/toxicity associated with or attached to sediments.

Option 5IR – Construct vegetated wetlands.

Option 6IR – Only under certain crop types, runoff water can be treated by applying mulch to the soil surface, cover crops, etc.

Reducing Pesticide Toxicity in Stormwater Discharges

Staff found a series of options for controlling and eliminating the off-farm movement of pesticides caused during storm and rain events.

Option 1SR – Each individual discharger controls and eliminates and/or recycles, or captures and treats the volume of stormwater runoff from rain that falls on the agricultural operation.

Option 2SR – Each grower stops any pesticide release and/or application during all rainy months.

Option 3SR – Each grower implements an on-farm stormwater pesticide management plan, including a detailed stormwater quality monitoring verification. The goal of the stormwater plan implementation is to effectively eliminate the off-farm movement of pesticides into any surface water body.

Option 4SR – Each grower within a sub-watershed or within a Planning Watershed area, is required to coordinate with all local water agencies and interested parties, and to participate, prepare, submit, and implement a stormwater management plan which should include management measures, strategies, practices, and/or treatment systems to effectively control, stop, and/or eliminate the release of pesticides from farmland to surface water bodies located downstream of the planning area.

Reducing Turbidity from Sediments in Surface Water Discharges

The MPs developed by UC Cooperative Extension (UCCE), Natural Resources Conservation Service (NRCS), US Department of Agriculture (USDA), and Resource Conservation Districts (RCD) for controlling erosion problems are effective tools for removing sediments from the water. Developed MPs include source controls, such as those that keep the soil covered, and treatments, such as vegetative treatment systems. Therefore, staff relies on the implementation of erosion control practices and measures to eliminate the discharge of sediments during storm and rain events. Properly covered and maintained riparian buffer zones have demonstrated to be effective in retaining sediments by slowing the water movement.

Controlling Water Temperature

Staff has not evaluated other practices to control water temperature other than the use of shade from properly covered and maintained vegetation in the riparian buffer zones.

Controlling Subsurface Drainage Discharges To Surface Water

In some areas of the region, subsurface drainage systems, such as tile drains, and subsurface pipes, collect water below the surface of the soil to release it on surface ditches, streams, and canals, at specific points. Such subsurface drainage systems are built and installed to drain water from the root zone and to allow farming to continue. This systems discharge groundwater to surface waterbodies.

Staff has found that a “controlled drainage-subirrigation system” is an innovative technique that controls the volume and seasonality of this type of discharges. Controlled drainage-subirrigation systems enables farmers to minimize the effect of dry summers on crop growth and reduce nutrient, specifically nitrate (NO-3) contamination of drainage water, and have been effectively constructed and implemented in other countries to protect surface water quality.

The systems include water level control structures installed below the tile outlets, which allows the users to plug lower drains when they need to raise the water levels forcing water back into the tile systems, or to pump water from holding ponds into the tile drains,

when it is needed for irrigation purposes. In other words, the system allows the users to control the water table levels.

Water table management or controlled drainage has the potential to significantly reduce nutrient discharges. Reductions are accomplished by reducing drainage outflow and by providing a denitrifying environment via a higher field water table level. Controlled drainage has been shown to reduce the annual transport of total nitrogen loss by 50% in concentration and of 45% in the volume of water drained (Drury et. al. 1997). Phosphorus (P) transport has also been documented to be reduced by controlled drainage. Water table management has been practiced in the humid environments of the mid-western and eastern parts of the United States in relatively flat landscapes.

Staff also found that drainage water has been re-used in regions where water is in short supply. The benefit of drainage water reuse is to reduce chemical and nutrient loads to receiving waters. Water quality of re-use water may be of concern, especially in arid regions where salt content of drainage water may be high. Where soils, geologic and hydrologic conditions do not permit constructed wetlands, agricultural drainage water may be re-used on successively salt tolerant crops. Drainage water may also be applied to forested systems. The reduced volume of final drainage water can be discharge to an evaporation pond; but care must be taken to insure that concentrations of chemicals do not exceed toxic levels.

Due to the poor quality of the groundwater discharges, especially due to salts, the dischargers might benefit from participating in a Regional Water Recycle Policy and address the problem as a basin system, with the collaboration of local stakeholders who could help finding a regional solution and effective management techniques to the salinity/nutrient loading issue.

REDUCING AND/OR CONTROLLING DISCHARGES TO GROUNDWATER

In January 2010, staff met with the Certified Crop Advisers (CCA) State representatives for the first time. In June 2010, staff and the CCA reps met with local/regional CCAs to develop standards, milestones, and targets to draft realistic and effective requirements, and in an attempt to avoid unnecessary recordkeeping and regulation. The group suggested extending the invitation to the local researchers and UCCE experts who are more familiar with farming conditions on the Central Coast, have experience in preparing nutrient management plans, or have been evaluating the demand of nutrients by crops grown on the Central Coast. Then, in July 2010, the CCA board of directors decided to step down from the process of drafting requirements and developing targets and milestones. Therefore, staff developed the requirements soliciting input and advice from the group of technical advisers invited for this task.

Approaches to Regulating Nitrate Discharges to Groundwater

Staff evaluated different options for dealing with the groundwater nitrate pollution problem. Staff first considered requiring dischargers to comply with the drinking water nitrate concentration limit of 10 mg/l NO3-N (nitrate as N) for any discharge of drainage water below the root zone.

We received numerous comments relating to nitrate loading versus nitrate concentration. Academia, crop advisors, and researchers strongly advised that the Water Board focus

groundwater protection requirements on N loading to the crop, instead of nitrate concentration leaving the root zone. Their general argument is that growers, using the current technology available and economic conditions, won't be able to comply with a nitrate-N "concentration limit" of 10 mg/l of NO3-N in the water that moves down, below the root zone. New techniques, practices, and ideas may have to be developed and implemented by Ag dischargers to comply with the state laws, policies and regulations, including cleanup and anti-degradation policies.

The November 2010 Draft Order requires growers to first reduce, minimize, and then ultimately reach a state of balance that preserves or restores nitrate concentrations that are protective of Water Quality Objectives. For those aquifers currently impaired, Water Quality Objectives must be achieved in a "reasonable amount of time". The targets related to the total reductions, minimization, and "balance state" of nitrate discharges requires that on the local scale of the individual discharger, the discharger must demonstrate that their nitrate loading is protective or results in restoration of the upper-most aquifer nitrate concentrations to Water Quality Objectives in a reasonable amount of time. This will require individual(s) with appropriate expertise (e.g., certified hydrogeologist) to determine what loading is protective of groundwater. Individual dischargers may choose to form a coalition to demonstrate that collectively they are meeting Water Quality Objectives. The ultimate goal is to achieve nitrate inputs and outputs that are protective at the aquifer-basin scale as well as the local scale. This will depend on many hydrological and geological factors (e.g., water balance consisting of volume and associated quality of water pumped; quality and volume of fresh water entering the system from rainfall or inflows; volume and quality of water imports; soil types; groundwater flow system; including architecture of the aquifer(s) and natural quality; climatological data; and all anthropogenic inputs and outputs of N) necessitating appropriate professional expertise to determine the overall nitrate loading goals considering the local conditions.

Dischargers will be responsible for successfully reducing nitrate loading to groundwater, for implementing a proper and effective local verification monitoring program that demonstrates nitrate loading reductions have been made, for analyzing the aquifer characteristics, for calculating the maximum quota or amount of N (discharge) that if entering the system/subbasin will be protective of the resource, and ultimately achieving reductions in the aquifer's nitrate concentrations to comply with Basin Plan Water Quality Objectives.

Therefore, staff recommends that the point of compliance be the upper-most aquifer, that individual dischargers or approved discharger groups be required to implement a staged Irrigation and Nutrient Management Plan, which systematically reduces N inputs to groundwater, and that they demonstrate Water Quality Objectives along any point in the groundwater flow system are being met, or restored within a "reasonable period of time".

Nutrient Management Plan - Central Coast Water Board staff also considered requiring dischargers to implement a nutrient management plan without specific targets and only based on N inputs (or loading of N units applied to farmland), since this approach would be similar to the one taken by the European Union Member States. This led to staff requiring a more complete "Nutrient Management Plan," which considers both inputs and outputs that will push the current farming system towards more efficient fertilizer use and ultimately restore and protect the groundwater resources on the Central Coast.

Irrigation management as part of the Nutrient Management Plan - Staff considered the inclusion of "irrigation water management" as part of the nutrient management plan requirement, recognizing that water management is one of the most important factors in minimizing the loading of nitrate to groundwater during the crop growing season, and in reducing the amount of nitrate that moves below the root zone and beyond the roots reach. Improving the irrigation water management has the added benefit of reducing groundwater quality problems caused by overdraft. Therefore, the type of irrigation system installed and the nitrate concentration in the irrigation water are two of the three indexes considered when characterizing the unit for their risk to contaminating groundwater.

Assigning Risk for Contaminating Groundwater

We have shown the data for our region, and concluded there is no doubt that nitrate levels in groundwater of areas with intensively managed crop systems, often exceed the public health drinking water standard due to leaching below crop root zones (Legg and Meisinger, 1982; Howarth et al., 1996; Zhang et al., 1998).

However, there are many factors to consider when deciding the risk that a ranch or discharger's operations pose to the groundwater resource. Staff analyzed potential risk factors including: a) management, such as fertilizers and total N applications, timing and location of application, type of fertilizer applied, irrigation system type and irrigation system efficiency, well casing; b) weather, including rain events duration and frequency, temperature, hours of sunlight; c) geological, such as soil type, geological formations, permeable and impermeable layers and depths, drain patterns, depth to groundwater, geology within 100 ft of each well in production, vadose zone characteristics; d) biological, such as crop type and its ability to uptake N, root zone depth, harvested portion of the plant, N concentration in plant tissues and harvested part; and e) local conditions, such as the nitrate concentration in groundwater, slope, soil infiltration rate and soil permeability, tillage depth and the use of deep ripping, water and soil pH causing infiltration problems, other. These factors are also considered in many studies when determining risk (e.g. Babiker at al, 2004; Brown, 2003; Elnagheeb, 1993; Kerr, 1987; Napier, 1993).

For simplicity, and because the assessment of the risk must be defined by the discharger themselves, staff decided to minimize the factors for assigning risk, to a minimum of three (3). Each one of the three (3) factors have indexes, which must be multiplied in a similar fashion as for the assessment of the Nitrate Groundwater Pollution Hazard Index, developed by UC Riverside. Staff decided to include the following three (3) factors in defining the risk for contaminating groundwater:

1. Hazard Index Rating for Crops, developed by UC Riverside,
2. Hazard Index Rating for Irrigation System Type, developed by UC Riverside, and customized to use in the Central Coast region, and
3. Hazard Index rating for Irrigation Water Nitrate Concentration, developed by Central Coast Water Board staff.

Based on the Hazard Index Rating for Crops, developed by UC Riverside, vegetable crops have the highest potential for contaminating groundwater. Water Board staff also found information supporting that conclusion: groundwater nitrate pollution has been

assessed by land use type, using a geographical information system tool, and has been widely attributed to vegetable production (Babiker at al, 2004). Since the list of high-risk crops developed by UC Riverside includes most of the vegetables crops grown in the region, Water Board staff has adopted the same crop risks list, to use for the Hazard Index Rating for Crops.

Based on the conclusion that vegetables are the crops with a higher potential for groundwater contamination, and supported by technical conversations and discussions with crop advisors, staff decided that the type of crop grown is the most important factor to consider when assigning a risk for potential groundwater contamination. Therefore, to define the three (3) categories of low, medium, and high-risk, staff analyzed all the results and scenarios represented by the overall risk result, placing all High-Risk Crops in the overall high-risk unit bracket.

Options considered. Based on the assigned risk for contaminating groundwater, staff analyzed options for requirements for each risk level. The first option considered was to require the same level and requirements from all operators farming within the same subwatershed/basin area. Another option was to require specific efforts from operators of high-risk units and fewer efforts from low risk units, in an attempt to minimize the regulations in the whole farming community. However, due to the high levels of nitrate concentrations found in most agricultural areas within the region, staff decided to take an option that falls somewhere in the middle of the two (2) options expressed above

Immediate requirements are focused on high-risk units and dischargers. Dischargers farming in high-risk units must: a) implement an Irrigation and Nutrient Management Plan (INMP), certified by a fertilizer specialist and to be protective of groundwater resources, b) submit information pertinent to the total N application to land, c) estimate the nitrate loading to groundwater and submit data results of the verification monitoring program, and d) meet N ratio targets and milestones. This requirement is not without precedent: the Regional Board 5 (RB5) Dairy Program permit requires implementation of a Nutrient Management Plan which must be signed by a licensed or certified professional fertilizer specialist.

a) The implementation of a comprehensive and effective INMP has been proven to be the most effective practice for minimizing nitrate leaching to groundwater. The implementation of an INMP is then the first step or requirement, in a long-term program aimed at returning the nitrate concentration to limits supporting the groundwater beneficial uses. This requirement includes two key elements: (1) to establish a budget accounting for all N inputs and outputs and to minimize N loading to groundwater, and (2) to improve the efficiency in the use of irrigation water.

   However, a nutrient management plan not only incorporates water and irrigation management and nutrient budget, but it must also develop nutrient trapping techniques to capture N in the root zone between crop growing seasons. A plan should also consider fertilizer rate and application strategies that account for soil properties, hydrology, crop tillage system, and specific site conditions.

   Trapping nutrients between crop growing seasons - Even when farmers carefully manage fertilizer applications, substantial nutrient losses occur

during the fall, winter, and early spring when crops are not growing and fields are bare, or in the short periods between crops when land is in preparation. Nutrient losses happen because there are no living plants removing nutrients from the soil and water from rain events leach them out below the root zone.

The weather dominates N loss through the impact of rainfall, which is the ultimate driver pushing nitrate all the way down to the upper aquifer. Since nitrate is most subject to leaching loss following the harvest of annual crops up until the following crop begins utilizing N, N management strategies should start with a good understanding of precipitation patterns (Cambardella et al, 1999). In some studies 88 to 95% of nitrate leaching losses occurred during this period (Drury et al. 1996).

A time series reconstructions of past nitrate concentrations at individual wells using Santa Clara Valley Water District's monitoring data shows a seasonal cycle with wintertime highs and summertime lows in several affected wells (Lawrence Livermore National Laboratory, 2005). Although several studies have demonstrated that most of the subsurface drainage loss of nitrate occurs between November and May, during the rainy season (Cambardella et al., 1999; Meisinger and Delgado, 2002), it is imperative to point out that the total leaching is also directly related to the amount of irrigation water applied during the crop growing season, which is the process that transfers and pushes the nitrate beyond the plant's reach. The more efficient a discharger can be in managing the irrigation water, the lower the amount of N that might leach below the root zone, while reducing the chances for the extra water to push nitrates that have already moved below the reach of the roots.

Options for trapping nutrients between crop growing seasons - Currently, there are only a few tools or practices aiming to trap the nutrients between crop growing seasons, such as cover crops or the application of microbe populations to immobilize minerals; however, none of those tools or practices on their own will ultimately minimize the N loading to acceptable limits for restoration and protection of groundwater beneficial uses. The dischargers will need to adopt numerous changes and improve their overall irrigation and nutrient management techniques and application efficiencies (Jackson, 2000).

Cover crops - Growers can use full cover crops, low-residue cover crops, furrow-bottom cover crops, and short-term cover crops to trap nutrients in the root-zone. Meisinger et. al (1991) reviewed the effect of cover crops on nitrate leaching and concluded that cover crops can commonly reduce both the mass of N leached and the nitrate concentration in the leachate by 20 to 80%, Martinez and Guiraud (1990) measured nitrate leaching with lysimeters in an irrigated corn-wheat rotation with and without a ryegrass cover crop and reported a 67% reduction in nitrate leaching with the cover crop; and Lewan (1994) found that leaching was reduced by 83% compared to no cover crop. However, when the cover crop is killed, its N is released back into the soil at a rate that depends on climate and management. This re-mineralized N can be effectively used by the

following crop because it returns to the soil when the cover crop dies, but can also be leached in subsequent seasons if careful measures are not incorporated.

Other options - Growers can also establish fallow covered land, include scavenger crops in the rotation, living mulches, use of nitrification and/or urease inhibitors, or apply ammonia instead of nitrate fertilizers during cold weather months.

There are various reasons for staff to request the submittal of the information of the total amount of units of N applied per acre, per crop, per parcel, and per year, from high-risk units:

1. To reassess the units risk for contaminating groundwater based on surface N applications;
2. To provide a range of potential loading of N to the environment and to the actual basins, in an effort to minimize the uncertainties related to the spatial and time-scale variations and the difficulties in monitoring actual loading occurring from Ag fields into the unsaturated (vadose) zone;
3. To point out the high N application areas and units;
4. Because the verification monitoring program will take time to be planned, developed and implemented, but N loading data must start to be collected as soon as possible;
5. And ultimately, because the N application to land is useful information to make sound regulatory decisions.

Irrigation and Nutrient Management Plan Requirement

Background - Many worldwide studies have shown that leaching of nitrate to groundwater has been minimized when farmers account for all the N credits applied to the cropping system and balance them out with the N units demanded by the crops (Watson and Atkinson, 1999; Meisinger and Randall, 1991; Deldago et. al, 2008).

The rate or amount of N applied, whether the source is fertilizer, manure, or any other source, is one of the most important factors affecting potential nitrate losses to water (Power and Schepers, 1989; Meisinger and Delgado, 2002). Nitrate that is not taken up by crops is subject to loss and may reach groundwater and/or surface water.

Improving irrigation and nutrient management measures have also been proven to be cost-effective. For example, in North Carolina, the USDA Water Quality Program team participated in the initiation of 8 demonstration projects, from 1991 to 1995, to assess the rate at which farmers adopted practices that could cost-effectively help to improve water quality, by reducing nonpoint source pollution. They reported a substantial adoption of practices related to nutrient management and irrigation water management, along with conservation cropping, cover/green manure crop, conservation tillage, pesticide management, and animal waste utilization. Surprisingly, the estimated reduction in annual N application rate averaged from 14 to 129 pounds per acre, and the estimated reduction in (P) ranged from 3 to 106 pounds per acre; the total annual reduction in 1994 were 22.3 million pounds of N and 10.3 million pounds of phosphorus. (USDA-NRCS Assessment of progress of selected water quality projects of USDA and State cooperators, 1996).

Other studies have focused on the effect of other controllable and uncontrollable variables in reducing and minimizing nitrate leaching to groundwater. Several authors concluded that tillage systems have a minor effect on nitrate losses compared to other N management practices (Randall and Mulla, 2001). The report's conclusion is that the implementation of a nutrient management plan was still the practice that resulted in the lowest amount of nitrate leaching.

Crop N Needs - UC Extension and NRCS specialists have developed N recommendations and formulas based on crop responses and N removal rates of crops. The formulas used to determine N fertilizer needs start with an expected yield goal and the amount of N needed to produce the yield. Therefore, it is necessary to adopt a reasonable method to determine expected yields to avoid over fertilization of the crop being produced. From that, it is then necessary to have a target or value for the amount of N needed to grow the crop and know the amount of N removed at harvest, to properly quantify the amount of N to apply to the crop.

Full accounting of all N sources in a cropping system must address multiple factors, such as crop rotation, history of manure application, tillage, and irrigation and fertilizer management. A given crop management system may provide highly efficient use of N from one source, but be relatively inefficient from another. N credits from sources such as legume crops grown in rotation, animal manure or other organic wastes, and N in irrigation water must also be considered as sources, and reduce the amount of N to be applied as fertilizers. Soil tests should also be used to measure the available N in the root zone. N present in the soil due to carryover from previous applications and mineralization of soil organic matter can be measured and subtracted from N recommendations to determine fertilizer needs. Due to uncertainties in the amount and timing of the N mineralized and available for crop uptake (Watson and Atkinson, 1999), the N produced through mineralization (most related to organic matter levels) is often taken into account only to a limited degree.

The combined evidence from laboratory, field, and other studies indicates that precise nutrient management also requires careful timing of the N applications, close monitoring of the amount of N and water inputs, and best management of crop production. More importantly, the growers must show flexibility to make necessary adjustments to N inputs during the course of a growing season to achieve satisfactory results. Staff recognizes that the timing, location, method, and type of N fertilizer and water applied to the crop play a vital role in the amount of nitrate available to the crop during the whole growing season. Those management decisions must be made onsite by the farmer and the certifier professional while implementing the irrigation and nutrient management plan, therefore the discussions specifically related to N applications, won't be included in this report. Water Board staff is concerned with the total amounts applied during the crop growing season and how much of that is lost to groundwater.

A valid irrigation and nutrient management plan must account for all the N inputs to the system, those applied such as fertilizers and compost, and those present in the system such as irrigation water and soil residuals. Failure to credit N supplied by soil (both residual and mineralized) and irrigation water often leads to over fertilization of N. The potential for nitrate leaching exists whenever N inputs are in excess of plant N uptake. There is little doubt that inefficient use of available N, due to over application and regardless of the source, contributes to nitrate in surface and ground water.

Irrigation Water Credits. There is still controversy over the amount of N units that can be credited to the water applied to the crop. Water Board staff asked for their opinion and inputs from recognized fertilizer specialist and crop advisors on the matter. The overall consensus is that all water entering the plant will carry nitrates within it the total amount of nitrate present and dissolved in it at the time. Reports and results found in the literature, also confirm that the amount of nitrate dissolved in the water up taken by the crops, must be accounted as a source of N (Hartz, 2000). Francis and Schepers, 1994, concluded that total irrigation NO3-N uptake efficiencies are similar to total side dress N fertilizer uptake efficiencies for a corn cropping system over two-year period irrigated with irrigation water having a high nitrate concentration. Unless studied and proven, water board staff will consider the total amount of nitrate present in the irrigation water to be a source of N to the crop, and the total concentration must be credited.

Irrigation water can contain significant amounts of N. Tracking credit for N in irrigation water saves on fertilizer costs and prevents over fertilization. The amount of N available from irrigation water can be calculated by multiplying the nitrate-N concentration (in ppm) times 0.23 for each acre-inch of water applied. Credit for N in irrigation water should be estimated based on the amount of irrigation water that is applied above the average rainfall, and compared with the estimated amount of water that evapotranspires through the crop. The difference could then be considered as lost water and, therefore, N dissolved in it and a potential source of groundwater contamination.

Saline Conditions and Salinity Management - There are still unknown interactions between cations and anions under saline conditions. Most studies show negative interactions between the chloride and nitrate concentrations, reporting that increasing Cl^- concentration in the solution suppressed NO^-_3 uptake by the plant (Kafkafi et. al., 1982; Mengel and Kirkby, 1987; Achilea, 2003; Flores et. al., 2002; Tarakcioglu and Inal, 2002; Irshad et. al., 2002). Moreover, increasing nitrate to the solution also shows a benefit by reducing the negative effects of the increased chloride concentration (Achilea, 2003; Bar et. al., 1997). It seems that there is a salinity level or threshold value, at which the implementation of a N budget can potentially cause negative effects to crop production, but such salinity threshold, is still unknown. Therefore Water Board staff recognizes that more research and understanding of nitrate uptake under saline conditions is necessary before being able to draw any conclusions.

Soil N Credits - While soils have routinely been tested for nonmobile nutrients such as potassium (P) and K in order to determine fertilizer application rates, soil testing for N has been problematic because much of the available N is often present in the nitrate form, which is mobile in the soil and subject to other losses such as denitrification. However, in attempting to recover and reuse the N that could be available to subsequent crops, the discharger must account for the amount of N present in the root zone at the time of planting, or immediately thereafter, and also account for the amount of N remaining in the root zone at the end of the crop season, as soil residual.

The measured available N in the soil, in a fall or spring soil test, may not be available later due to leaching caused by heavy rains. However, preplanting soil tests, especially when taken at deeper soil depths, have been reliable in relatively dry climates, such as ours. Recent research has developed modified soil testing procedures to improve the reliability of soil tests in predicting N available to crops during the growing season, with soil samples usually collected within a month to planting. The benefit of basing N

fertilizer applications on appropriate soil tests has been demonstrated over wide areas (Guillard et. al., 1999; Kanwar et al., 1996; Sojbedji et al., 2000; Breschini and Hartz, 2002). Schepers et al. (1993) concluded that basing N fertilizer rates on the deep soil nitrate testing recommended in Nebraska reduced ground water nitrate concentrations by about 0.5 ppm per year in the Platte River Valley. Andraski and Bundy, 2002, concluded that adjusting N rates based on "late spring" or "pre-side dress N test" (PSNT) or credits, reduced N rates by 90 to 102 kg N ha-1 and increased profitability, compared to not adjusting the N rate from the results of the PSNT.

Other Known N Sources - Staff also wants to point out that the amounts of N from dry and wet aerial depositions and from the mineralization of the native soil organic matter are not required to be accounted for under this Order. There are too many uncertainties and unknowns regarding the amount and timing of the N available from depositions and mineralization to be required to use as a source of N. However, these sources of N could or might be required to be accounted for once we have a better understanding of their amounts and availability.

Targets

Staff has developed interim targets to be met by dischargers growing crops in high-risk units. Dischargers have the option to comply with the given targets, or to individually submit reports demonstrating they are not contributing to groundwater impairment. The individual assessment report must be accompanied by a verification monitoring program that effectively and accurately measures the amount of N loading discharged from the risk unit (flux of water and nitrate concentration over time), in compliance with the Basin Plan Water Quality Objectives.

Since the interim targets are only one of the many steps required, they should not be considered as the ultimate goal or the ultimate farming fertilizer use efficiency measure. More stringent targets will be developed during year 4, to minimize all N potential losses to groundwater and to eliminate N loading in excess of the maximum allowable amount of N (loading) determined to restore and be protective of groundwater beneficial uses.

The first targets of 1 and 1.2 are based on the total amount of N (inputs) applied over the crop N demand or needs. The targets are based on crop needs, since there is consensus among the fertilizer specialists, in considering this equation as the first step for improving fertilizer use efficiency. Dischargers will be required to calculate the "Typical N Crop Uptakes" to use in a mass balance equation when accounting for the N demanded by the crop. This target is considered not stringent enough, and it should not be used as evidence for compliance with the nitrate loading maximum allowable amounts (quota) per basin. It is only an interim target.

The next target to be developed will be based on the amount of N removed at harvest. Such targets must be met by dischargers farming in high-risk units by year 6, from adoption of the Order. The actual amount of N removed depends on the portion of the crop that is removed (harvested) from the system, the concentration of N in the portion of the plant removed, and the total yield. Fertilization schemes and targets based on minerals removed at harvest have been developed and adopted by RB5 Dairy Program permit and by other countries, requiring dischargers to meet a target based on N removal (Ghio, 2010). One of the study conclusions was that the applications of N, K, and Sulfur at grain removal rates, resulted in high crop yields, while maintaining or

improving soil nutrient balances and, thus, soil fertility conditions. By applying the amount of N that will be harvested, the potential for nitrate leaching to groundwater causing pollution are highly minimized.

This second target, although more stringent, might still not be low enough to comply with the nitrate loading maximum allowable amounts (quota) to protect and restore groundwater in the subbasins. During and after year 6, that assessment will be made possible, by comparing and analyzing the results of the monitoring program. This target, which is based on N removed at harvest, must be developed during year 4, evaluated during year 5, and met at high-risk units by year 6.

The ultimate goal is to develop a N quota, which will be the allowable N loading amount per subbasin. The quota will account for the total volume of water entering and leaving the system (inputs and outputs), the total amount of N entering (loaded) into the system, and the resulting nitrate concentration in the water of the upper-most aquifer.

Long-Term Program to Reduce, Minimize, and Ultimately Restore the Groundwater Quality

In analyzing all options, staff recognized that in order to reduce, minimize, and eventually achieve a "balance state" of N discharge protective of the groundwater resource, which is specific to each subbasin or groundwater flow path, a series of increasingly more stringent steps were necessary to be taken as part of a long-term restoration and protection program. The subbasin's water quality must be first, restored, and nitrate concentrations reduced to limits in compliance with the Basin Plan Water Quality Objectives, and second, protected by maintaining nitrate loading limits supportive of all beneficial uses.

The current groundwater quality conditions, and the threat that imposes to human health, calls for immediate and aggressive actions that must be taken as soon as possible, to restore the quality of our groundwater resources and protect the environment and health of residents of the Central Coast.

Staff has realized that the long-term program must:

A) Provide all necessary information to fill current data gaps, regarding:
   1. Local and regional water quality conditions;
   2. Total regional inputs and outputs of N from Ag lands;
   3. Milestones and targets that dischargers must comply with;
   4. Standards of the amount of N needed by crops grown in the region;
   5. Standards for the amount of N removed at harvest for crops grown in the region;
   6. Measurement tools that effectively quantify loading to groundwater; and
   7. Technical improvements to minimize N losses to groundwater from Ag lands.

B) Require immediate actions to stop the N loading to groundwater. As explained above, staff has determined that certain crop types and types of operations are posing a higher risk to contaminating groundwater than others. The first step in immediately reducing nitrate loading to groundwater is by focusing on the high-risk dischargers. Therefore, Water Board staff is prioritizing efforts to minimize N loading from high-risk units, by requiring the operators to account for and submit information regarding N applications to land and estimations of N loading to groundwater.

The long term program process starts with the targets, milestones, and requirements included under the 2004 Order, but future milestones, targets, data analysis, and requirements, must be developed under subsequent Ag Orders.

IV. Options for Riparian and Wetland Area Protection Requirements

Wetland Regulation, Definition and Delineation

Dredge and fill activities in streams and federal wetlands are regulated by the Water Boards though the federal Clean Water Act Section 401 water quality certification program. Through the 401 program, the state may deny or condition federal Clean Water Act Section 404 permits as necessary to ensure compliance with state water quality standards.

The federal government's ability to protect wetlands under the Clean Water Act have been limited by the Supreme Court decisions in *Solid Waste Agency of Northern Cook County (SWANCC) v. U.S. Army Corps of Engineers* in 2001 and *Rapanos v. United States* in 2006. The result was the effective removal of federal oversight and protection of beneficial uses and wetland functions to wetlands that are isolated or not geographically connected to navigable waters.

The Water Board uses its Porter Cologne authorities to protect waters of the state, including wetlands. The California Water Code section 13050 (e) defines waters of the state to mean "any surface water or groundwater, including saline waters, within the boundaries of the state." The Water Boards jurisdiction over wetlands is broader than that of federal jurisdiction and extends to wetlands not covered by the Clean Water Act Section 404/401 process. Wetlands that are geographically isolated from navigable waters would be one example of a wetland that is protected by Porter Cologne, but does not fall under federal jurisdiction.

This November 2010 Draft Order utilizes the Army Corps of Engineers definition of wetlands. This definition is commonly referred to as the "three parameter" approach as it requires hydrophytic vegetation, hydric soils, and wetland hydrology to be considered a wetland. This is a change from the February Preliminary Draft Order. The February Preliminary Draft Order proposed to utilize a definition that is being considered for adoption by the State Water Board and can be more inclusive of various forms of wetlands. This November 2010 Draft Order proposes to use the Army Corps of Engineers definition since it is the most common definition currently used by the Regional Boards. Additionally, should the State Water Board adopt a new definition for wetlands, which is expected to be brought before the State Water Board in late 2011, this November 2010 Draft Order makes provisions for utilizing the newly adopted definition at that time.

Water Board staff consider the more stringent Army Corps of Engineers definition as appropriate since the Army Corps of Engineers has produced two supplemental guidance documents specific to our region (described below) that account for regional variations such as drought conditions that help identify areas as wetlands that may not have been before the supplements were adopted.

This Order proposes to delineate the boundaries of wetlands based on the common method used for delineating federal wetlands as described in the three federal documents listed below:

- U.S. Army Corps of Engineers Wetland Delineation Manual, 1987, Wetlands Research Program Technical Report Y-87-1, Final, Environmental Laboratory, U.S. Army Corps of Engineers Waterways Experiment Station, 3909 Halls Ferry Road, Vicksburg, MS 39180-6199
- U.S. Army Corps of Engineers (2008). "Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)," ERDC/EL TR-08-28, U.S. Army Engineer Research and Development Center, Vicksburg, MS
- U.S. Army Corps of Engineers. 2008. Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region, ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-08-13. Vicksburg, MS: U.S. Army Engineer Research and Development Center

This delineation method would also be used for wetlands that may not fall under federal jurisdiction but are covered by Porter Cologne. The need for delineation would only arise along with a proposal for wetland alteration.

Authority and Policies

The Water Code places responsibility on the Water Boards for protecting and restoring the beneficial uses of waters of the state and assigns Water Boards the authority to regulate any activity or factor which may affect the quality of the waters of the state. In order to protect the biological and aquatic habitat beneficial uses, the Central Coast Water Board must protect aquatic habitat, including riparian and wetland areas, from further degradation.

Controllable water quality should conform to the water quality objectives contained in the Basin Plan. When other conditions cause degradation of water quality beyond the levels or limits established as water quality objectives, controllable conditions should not cause further degradation of water quality.

Lack of and/or dysfunctional riparian and wetland areas adjacent to agricultural land use result in degradation of water quality. This Order's requirements will improve water quality that has been degraded and protect beneficial uses by *controlling conditions* by agricultural operators in or near riparian and wetland areas, *such as land disturbance from vehicles or removal of vegetation that buffers streams,*.

The Water Quality Control Plan for the Central Coast Region (Basin Plan) has the following riparian buffer requirement which states in part that:

"A filter strip of appropriate width, and consisting of undisturbed soil and riparian vegetation or its equivalent, shall be maintained, wherever possible, between significant land disturbance activities and watercourses, lakes, bays, estuaries, marshes, and other water bodies."

Several statewide policies have been adopted to protect wetlands and riparian areas, including the Policy for Maintaining High Quality Water (State Water Board Resolution No. 68-16); the Wetlands Conservation Policy (Executive Order W-59-93), also known as the state's "No Net Loss Policy" for Wetlands; and the Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program (May 20, 2004) (State Water Board 2004a) (State Water Resources Control Board 2008).

The "No Net Loss Policy," also known as the California Wetlands Conservation Policy (adopted by Governor Wilson in 1993), established the state's intent to develop and adopt a policy framework and strategy to protect California's unique wetland ecosystems. One of the goals of this policy is to ensure no overall net loss and achieve a long-term net gain in the quantity, quality, and permanence of wetlands acreage and their values in California, in a manner that fosters creativity, stewardship and respect for private property.

On average, created, restored, and enhanced wetlands are of lower quality than intact, natural wetlands. State-permitted wetland projects are contributing to a net loss of wetland functions and values.

In order to comply with the "No Net Loss Policy and other state policies described, and to protect beneficial uses, this Order protects existing riparian and wetland areas. Where vegetation is lacking or existing vegetation is neither protective of beneficial uses nor prevents discharges of waste to waters of the state, the Discharger or group of Dischargers shall submit a plan for establishing riparian buffers in accordance with Basin Plan requirements.

Existing Aquatic Habitat Protection

In order to prevent further loss of aquatic habitat and comply with the "No Net Loss Policy", this Order includes protection of existing aquatic habitat, including perennial, intermittent, or ephemeral streams and riparian and wetland areas. The Water Board may grant authorization for water quality improvement projects or restoration of aquatic habitat based on the concept of avoid, minimize and mitigate that is often used by the California Department of Fish and Game for streambed alteration agreements and for 401 certifications throughout the state. Based on this concept, a grower must first demonstrate that all appropriate and practicable measures to avoid impacts to aquatic habitat have been taken. If a grower demonstrates that habitat disturbance cannot be avoided, the grower must take all appropriate and practicable measures to minimize direct, secondary, and cumulative impacts to aquatic habitat and water quality. Finally, the grower must provide compensatory mitigation for any remaining unavoidable and minimized activities so that the proposed activity does not result in a net loss of aquatic habitat.

The protection of existing aquatic habitat will help to protect existing high quality water and help to resolve water quality impacts such as turbidity, temperature, dissolved oxygen, and in some cases toxicity. Maintaining riparian functions help control water quality. Streambank stabilization helps to keep erosion in control and reduce turbidity, stream shading helps with water temperature control, sediment and chemical filtration helps to control turbidity, toxicity and nutrient pollution. Flood water storage helps to reduce peak storm flows and erosive energy and thus turbidity, and helps with aquatic life support, wildlife support and many of our beneficial uses of water.

Ephemeral streams on agricultural land act as important delivery systems to downstream waterbodies. They also often serve to collect overland flow and stormwater runoff and direct those flows off-site in a stabilized channel. Ephemeral streams plowed under during agricultural operations can lead to erosion, rilling and gullying as water flows over the general landscape outside of a stabilized channel. The protection of ephemeral streams on agricultural lands will help to decrease turbidity in downstream waterbodies.

Riparian Buffer Plan

In the February Preliminary Draft Agricultural Order this requirement was referred to as the Riparian Function Protection and Restoration Plan (RFPR Plan). The RFPR Plan was to be based on riparian functions such as streambank stabilization and erosion control, stream shading and temperature control, sediment and chemical filtration, flood water storage, aquatic life and wildlife support when considering buffer widths. The RFPR Plan is changed in the November 2010 Draft Order to the Riparian Buffer Plan and does not require preparation by a certified engineer or geologist.

This Order requires Buffer Plans from Dischargers adjacent to or whose operations contain streams listed as impaired for water temperature or turbidity on the 2010 Clean Water Act Section 303(d) List of impaired Waterbodies. These dischargers must submit a Buffer Plan for approval by the Executive Officer that is consistent with current Basin Plan riparian buffer requirements and includes a minimum thirty foot buffer. Chapter 5, page V-13, Section V.G. of the Basin Plan states in part that, " a filter strip of appropriate width, and consisting of undisturbed soil and riparian vegetation or its equivalent, shall be maintained, wherever possible, between significant land disturbance activities and watercourses, lakes, bays, estuaries, marshes and other waterbodies. For construction activities, minimum width of the filter strip shall be thirty feet, wherever possible.

The buffer plan is for areas that are lacking or deficient in a buffer that will protect water quality. It is not meant to be applied to areas that are currently buffered or surrounded by riparian vegetation or its functional equivalent that are greater than thirty feet, unless it is determined that additional buffering capacity beyond the thirty feet is needed in that area to protect water quality. For areas that have a minimum thirty foot buffer and are protective of water quality, dischargers will not need a Riparian Buffer Plan and will be required to protect existing vegetation and buffer.

Regional Board staff considered the scientific literature available when recommending a minimum buffer width. According to Fischer and Fischenich (2000), the following are riparian buffer recommendations as described in scientific literature for protection of the noted functions in Table 5 below:

Table 5: Riparian Buffer Recommendations

Function	Distance on each side of stream (Feet)
Water Quality Protection	16 – 98
Flood Attenuation	65 – 490
Stream Stabilization	33 – 65
Input of Organic Materials	10 – 33

Riparian Habitat (wildlife)	98 – 1,640+

According to a literature search on riparian functional width by Collins and Sutula et.al. (2006), the total number of riparian area functions increase with riparian width. Table 6, below contains a partial summary of the range of minimum and maximum widths described in the literature reviewed by these authors.

Table 6: Range of Minimum and Maximum Riparian Functional Widths

Riparian Function	Range of Minimum Observed or Recommended Minimum Widths (ft)	Range of Maximum Observed or Recommended Minimum Widths (ft)
Sediment Entrapment	16 - 98	82-600
Chemical Filtration or Transformation	13-98	98-860
Flood Control	24-82	197-230
Aquatic Life Support	59-66	98-361
Bank Stabilization	16-98	49-125
Wildlife Support	25-328	295-984
Aquatic Habitat Cooling	36-98	49-328

The February Preliminary Draft Order proposed specified buffer widths of 50, 75 and 100 feet. Collins and Sutula et.al. (2006) list the maximum range of buffer widths as the preferred buffer width. While the February Preliminary Draft Order buffer widths are more protective of water quality, regional board staff believes that a minimum 30 foot buffer width is a good first step toward establishing buffers protective of water quality and is similar to Basin Plan requirements for a thirty foot buffer for construction activities. The recommended minimum thirty foot buffer width also falls within several of the minimum recommended widths for water quality functions in the literature reviews by Fischer and Fischenich (2000) and Collins and Sutula, et.al. (2006).

For purposes of November 2010 Draft Order, the minimum thirty foot buffer is to be measured horizontally from the top of bank on either side of the waterway, or from the high water mark of a lake or wetland and mean high tide of an estuary. Where existing riparian vegetation width is greater than the minimum fifty foot buffer width, the discharger must protect the existing width of the riparian vegetation as described in the existing aquatic habitat protection measure in the Order. The minimum buffer width applies to all perennial and intermittent channels. Ephemeral channels will be protected by the existing aquatic habitat protection measure but have no minimum buffer width. Agricultural drainage ditches that are constructed for the sole purpose of agricultural use and are not or never were natural streams, are not subject to the requirements of the Riparian Buffer Plan.

This Order recognizes that thirty feet is a minimum buffer requirement and that increases in buffer width may be necessary to protect water quality. More narrow buffer widths may be requested of and approved by the Executive Officer and must be thoroughly justified through analysis of site specific conditions.

This Order requires the discharger to plan for three vegetated zones within the thirty foot buffer. Native riparian species are preferred, but may be substituted with their functional

equivalent. Technical documents by the NRCS (2006), Welsch (1991) and Tjaden and Weber describe a three zone approach to riparian buffers with components that are similar to the one used for this order. The goals for the three zones are to address water quality impairments and are described below:

1. Zone 1 – A mix of trees and shrubs that provide shade and streambank stability. A mix of woody species that vary from large tree species as they mature to understory trees and shrubs will provide canopy cover and shading next to the water.

2. Zone 2 – A mix of trees and shrubs that will absorb waterborne nutrients and pollutants and allow water to infiltrate into the soil.

3. Zone 3 – Zone 3 is a transitional zone between cropland and zones 1 and Stiff multi-stemmed grasses and forbs are preferred and will help disperse concentrated flows. The goal is to help slow flows, spread flows out into sheet flow and promote sediment deposition.

These zones are meant as guidelines. In some cases natural conditions may not support the vegetation described in the specific zones. In these cases dischargers can implement alternatives to resolve water quality impairments. Since Regional Board staff's total recommended minimum buffer width is smaller than other buffer width recommendations that utilize this zoned approach, it may be necessary to combine zones one and two to allow for the sun needed to grow grasses and forbs recommended to promote sediment deposition in zone three.

According to Tjaden and Weber, "the three-zone concept provides a framework for planning and grouping types of plantings. Combining fast and slow growing trees, shrubs, grasses, and forbs helps protect the waterway and provide a diverse habitat for wildlife. Trees and shrubs provide perennial, deep-reaching root systems to hold the soil and absorb nutrients into the woody biomass for long-term storage. Forbs and grasses provide a high density of stems to slow surface runoff, trap sediment, and absorb nutrients." Regional Board staff has deliberately left out recommended widths for each zone and will let the discharger determine that based on site specific conditions. The intent is for the three zones to occur within the minimum thirty foot buffer if possible.

Dischargers required to submit a Buffer Plan must submit it within four years of the board adoption of this order. Again, this requirement only applies for buffer areas with less than thirty feet of riparian vegetation or its functional equivalent and areas that are deficient in vegetation and do not protect water quality.

The Order also allows Dischargers to group together and combine resources to address riparian buffers at a larger scale if so desired. Grouping together would allow Dischargers to address riparian buffers at a reach or sub-watershed scale rather than have various disjunct plans for adjoining properties.

Staff evaluated whether to confine this requirement to those operations adjacent to streams already degraded for pollutants or impairments that benefit most from riparian and wetland habitat as a buffer or from installed vegetative buffers, such as sediment, turbidity and temperature. Staff considered also requiring buffers for operations adjacent to waterbodies impaired by pesticides and toxicity as well.

While buffers on all waterbodies with the broader list of impairments would protect beneficial uses and reduce pollutant loading better, as a pollution control practice, vegetated systems are most effective for reducing pollutant loading for pesticides that attach to sediments and less effective at reducing pesticides (see discussion Attachment A to this document).that are most soluble in water. Since most of the toxicity and pesticide impairments in agricultural areas of the region are from water soluble pesticides, the measure widely applied would have limited benefit addressing pesticide loading and its greatest benefit controlling sediment-related impairments. However, any buffers installed are likely to improve beneficial use protection related to some level of pesticide removal either by filtering sediments with pesticides attached or by slowing of runoff water or infiltration that reduces flow of water with pesticides in it.

Explanation of Other Aquatic Habitat Protection Options Considered

Buffer Widths based On NHDPlus

Staff considered requiring a tiered approach to buffer widths around waterbodies. Staff grouped streams within the Region into tiers based on the estimated unit runoff mean annual natural flow from the National Hydrography Dataset Plus (NHDPlus). NHDPlus was developed in 2005 for the US Environmental Protection Agency and the U.S. Geological Survey. NHDPlus utilizes a network of flow gages, that are not impacted by reservoirs and irrigation withdrawals, in order to estimate mean annual flow under "natural" conditions. The nearest gages were identified using a 200-mile maximum search radius from each specific subbasin. Flow at any point on a drainage flow line was computed based on the drainage area of the upstream catchment basin and the unit runoff (cfs/km^2) data for that subbasin (USEPA and USGS, 2009). This provided a uniform methodology that allowed staff to select stream flow cut-off points that grouped the streams of our region into three tiers of buffer widths. Minimum widths considered are shown below in Table 7.

Table 7: Minimum Buffer Widths

Tier	Minimum buffer width	Modeled average daily natural flow
Tier 1	50 feet	1- 15 cfs
Tier 2	75 feet	15 – 50 cfs
Tier 3	100 feet	50 cfs and above

With this system, smaller perennial streams would have a smaller buffer than our larger perennial streams. For example, with the three-tier approach, San Luis Obispo Creek would have a 75-foot buffer and the Salinas River a 100-foot buffer.

While information indicates that a larger riparian buffer better protects water quality and more riparian functions, Regional Board staff opted for a minimum thirty foot buffer instead since it was consistent with our current Basin Plan buffer requirements for construction projects and it falls within several of the minimum recommended widths for water quality functions in the literature reviews by Fischer and Fischenich (2000) and Collins and Sutula, et.al. (2006). In areas that have a minimum thirty foot buffer and are protective of water quality, dischargers will not need a Riparian Buffer Plan and will be required to comply with Regional Board Staff's proposed Existing Aquatic Habitat Protection requirements.

County Ordinances

Most counties within the region have existing buffer ordinances or requirements. However, it is common for agricultural lands to be exempt from these ordinances. County ordinances commonly have two different widths, one for perennial streams and another for intermittent streams, as designated by blue line streams on United States Geological Survey 7.5 minute maps. Various county ordinances are shown below in Table 8:

Table 8: County Ordinances Buffer Widths

County	Riparian Buffer (feet)
Ventura	100 in coastal zones
Santa Barbara	50-100 in coastal zones
San Luis Obispo	50 – 100 in coastal zones
Monterey	50 – 150 in coastal zones
Santa Cruz	30 – 100
San Benito	50

Santa Clara County has guidelines that encourage a 100-foot buffer from creeks. They are working on adopting a similar ordinance. Generally, the minimum widths listed in Table 7 are for areas adjacent to intermittent channels and the maximum widths are for perennial streams or wetlands and lakes. The recommendation that staff are proposing does not take varying stream sizes or waterbodies into account, we are proposing one width for all waterbodies and wetlands.

Regional Board staff considered requiring riparian buffer requirements similar to those proposed by the various counties within our region. Stream flow is one of the common and important considerations to take into account when determining buffer width. However, Regional Board staff opted for a minimum thirty foot buffer (plus vegetation and other guidelines) across stream types and waterbodies based literature supporting that thirty feet can provide appropriate water quality protection and consistency with our Basin Plan. In areas that have a minimum thirty foot buffer existing and are protective of water quality, dischargers will not need a Buffer Plan but and will be required to comply with requirements to protect existing habitat.

Cal Fire

The California Forest Practice Act requires maintenance of riparian vegetation in buffer strips called watercourse and lake protection zones (WLPZs). The WLPZs are typically applied during timber harvest activities and must be specifically addressed in a written timber harvest plan by a registered professional forester with the California Department of Forestry and Fire Protection (Cal Fire). There are four classes of watercourses based on the watercourse's use as described below in Table 9:

Table 9: Cal Fire Four Classes of Watercourses

Class	Description
I	Streams that contain fish or are domestic water supplies.
II	Streams that do not contain fish but do contain other

	aquatic life or are within 1,000 feet of a Class I stream.
III	Watercourses that do not support aquatic life but have the potential to deliver sediment to a Class I or II stream
IV	Human-made streams for domestic, agricultural, or hydroelectric supply or for other beneficial use.

Depending on slope, the WLPZ for class I watercourses range from 75 to 150 feet on each side of the stream. On class II watercourses, the WLPZ ranges from 50 to 100 feet. Class III and IV streams require equipment exclusion or limitation zones that prevent equipment from operating near the watercourse and buffers are established on a case-by-case basis. Table 10 has a description of the slopes and recommended widths in feet.

Table 10: Description of Slopes and Recommended Widths

% slope	Class I	Class II	Class III	Class IV
<30	75	50	varies	varies
30 – 50	100	75	varies	varies
>50	150	100	varies	varies

Regional Board staff considered applying something similar to this option to agricultural operations but did not recommend it because Regional Board staff considered the recommended option of protecting existing aquatic habitat to be more in-line with the "No Net Loss Policy" and more protective of water quality and beneficial uses. If Discharges propose to harvest timber within riparian areas, then the rules of the California Forest Practice Act would apply along with these WPLZ rules.

Natural Resources and Conservation Service

The NRCS has a conservation practice standard for riparian forest buffers (Code 391) that describes three vegetative zones comparable to what this order describes. The main difference in the NRCS standard is that they have more stringent requirements for buffer widths than what is proposed in this order and the widths are based on active floodplain widths. The minimum width as described by the NRCS is thirty five feet for zones one and two and includes a provision for expanding that to meet the minimum requirements for wildlife or aquatic species and associated communities of concern. The thirty five foot minimum is before zone three is considered. Zone three shall be added to control concentrated flow or mass soil movement when adjacent to cropland or other sparsely vegetated or highly erosive area. There is no minimum given for zone three, however, there is a maximum stated that the combined width of all three zones will not exceed 150 feet. See Table 11 below for an outline of the combined widths for zones one and two.

Table 11: Combined Riparian Forest Buffers Widths for Zones One and Two

Active Floodplain Width	Buffer Width	Determination
<= 105 feet	35 feet	Minimum
>105 feet, but <= 333 feet	36-99 feet	30% of the active floodplain
>333 feet maximum	100 feet	

Since the largest combined width for zones one and two is one hundred feet, this standard would allow for up to a fifty foot zone three. These widths are much greater than what regional board staff is proposing in this order. It is notable that the NRCS standard does allow for the removal of tree and shrub products from zone one and zone two if it does not compromise the intended purpose of the respective zone. The NRCS encourages removal of timber, fiber, forbs, nuts and fruit from zone two if it does not compromise the intended purpose of the zone. Regional Board staff's proposal would also allow for the harvest of trees as long as the rules of the California Forest Practices Act are met. If dischargers would like to remove product such as nuts, fruit or fiber, they may propose that through this Order's Riparian Buffer Plan requirement as long as the plan also describes how the goals of the three zones are met.

While some aspects of this Order's requirements are consistent with NRCS descriptions, Regional Board staff opted for a smaller minimum of a thirty foot buffer since it falls within several of the minimum recommended widths for water quality functions in the literature reviews by Fischer and Fischenich (2000) and Collins and Sutula, et.al. (2006). Again, thirty feet is consistent with our Basin Plan.

Attachment A

Track 1020

RB (00:011) – Okay, so for item 23 we want to focus initially, again in the interest of time and the people who are waiting, on the two items that are in the EO report regarding Department of Pesticide Regulation (DPR) and their draft surface water regulations, coordination with Department of Fish and Game (DFG), specifically regarding aquatic habitat issues, and then as I said earlier in the meeting we're also going to roll into this discussion of the implementation status that we gave you in item 12. Angela you were going to start things off I believe? Angela Schroeter of our staff.

AS (0:02:00) – So the items in the EO report related to the AG order is follow up to the July workshop. At the July workshop Board Members asked staff to clarify the relationship between the authority of the Board and DPR as well as how we coordinate with Fish and Game. So we put specific questions within the EO report about those two items. We have DFG staff here, Mike Hill. As well as I believe a DPR representative.

RB (0:02:37) – That's Mr. John Sanders, Chief of the Environmental Monitoring Branch.

AS (0:02:42) – And as part of that, if the Board would like me to do this, I also have a few slides that will summarize the public input and outreach that we've done thus far related to the order. Should I start with that first? Then we'll get to the coordination of our agencies?

(03:32) Okay, I won't go through this in great detail because actually Mr. Shimeck sort of outlined this already. So we started the, as you all know, we started the ag order outreach in Dec. 2008 and that started with our Ag Advisory Panel. We did that for approximately 3mths between Dec.2008 and Feb. 2009. At that point, both Water Board staff as well as members of the panel felt that we would make more progress with a facilitator. So we had a facilitator come in from State Board and met several times between March 2009 and Sept. of 2009. In Dec. we brought an update to the Board. At that time the Board also invited stakeholders to present alternatives. They had four months to produce alternatives. And we received three. We also in Feb. released a preliminary draft ag order that was in response to Board's direction and also in response to requests from stakeholders that they wanted a more specific idea for what staff was thinking. We also had sixteen outreach events and meetings where Water Board staff reached out to stakeholders including ag industry, environmental organizations, as well as environmental justice organizations to provide the context for how we're approaching the ag order, talk about requirements and to start getting their input as well. We also did the workshops in both May and July and those workshops were well attended and I think represented a lot of the stakeholders in the region. So that's what we've what we've done just through July of 2010. Since the workshop in July 2010 staff has also been proactively trying to get additional input from stakeholders. This is the list of stakeholders that staff has contacted. The discussions with these individual stakeholders varies, from answering their questions, to asking questions about their comments. But I just wanted to show you sort of the breadth of the outreach since July that we've attempted here. In addition, as was mentioned, staff has also attended four different stakeholder meetings. The first was held on Aug. 16 and that was with CA Farm Bureau Federation, Coalition, Grower- Shipper Association and many other ag industry reps. And the following day we met with environmental organizations as well as the Environmental Justice Coalition for Water. We also met with nurseries and garden centers and then also with SLO Farm Bureau and local ag reps. We've also scheduled an additional upcoming meeting with the Strawberry Commission. And we've also held one public meeting and that was on Aug. 16 and that was for our CEQA scoping. So going back just to show you sort of the nature of the input we're trying to get and that we're receiving, this is what we showed the Ag Panel in Dec. 2008. We talked about what our goals were and our legal requirements. And we were seeking specific input on targets, points of compliance, how we would confirm compliance with monitoring and reporting, what some milestones were, in order to measure progress and also time. So in Dec. and actually up to now our goal isn't necessarily to incorporate requirements that dictate how we do that but how we get to these points. Unfortunately, as of now, this table is still not filled in terms of input. So we have not

received specific input on targets, compliance, monitoring, milestones, or timeframes. That's not to say that we haven't gotten lots of comments. We've gotten 1200 comment letters we are reviewing those comment letters, we're summarizing them to figure out what the key issues are. We also have received the three alternatives. While we're still talking about the benefit of stakeholder outreach, I did want to mention that we have received some detailed recommendations from the nurseries and garden centers. So we did have positive outcome from those meetings and the recommendations that they've given us are specific to tiering. So, while we still haven't gotten some of these other things like targets, points of compliance and monitoring, we did receive some specific recommendations that's very helpful from the nursery and greenhouse representatives. So this in summary is where we are in terms of what we've attempted to achieve in public outreach. The input that we've received thus far. We will use all of this input to inform the next revised draft order and any input that we can receive up until that release. So if you have any questions, this is where we are.

MT (0:08:54) – Angela, you've said that you've gotten some input to fill in this table and you mentioned the nursery growers provided some input on filling in the table. How about the environmental groups?

AS (0:09:08) – The environmental groups, yeah I'm sorry I should've mentioned that. The environmental groups are supporting, are mainly supportive of staffs' Draft Order. However what is different is that they have submitted comments to suggest that our timeframe for compliance is too long in some cases. So they'd like to see some shorter timeframes.

JY (0:09:33) – Has the Farm Bureau provided any specific input?

AS (0:09:37) – Not relative to these specific issues. We have received lots of input and comments from the Farm Bureau but nothing regarding these specific points.

GS (0:09:49)– So you're saying that of all those 1200 comments and three alternatives you couldn't fill any of this in?

AS (0:09:58– What we have received thus far is what - the general comment is what staff has presented is not workable. We haven't received…

GS – Right

MT – We have filled this in. We filled it in.

GS - No, no, no, I understand that. But you couldn't tell from these other 1200 comments what -to fill these in for them.

AS – We have not received information that would allow us to put a different…

GS – Thank you.

RB – Except as you said the environmental groups' alternative did have specifics as far as milestones and that sort of thing.

MT – And the nursery growers have provided some information.

AS – Right, that's really related to tiering in terms of how we might prioritize nursery growers for requirements. So we have not yet even, in that instance, gotten to targets, points of compliance, monitoring, and timeframes.

MT (0:10:51)– And so where this table came from is when we decided to reconvene the ag panel in Dec. 2008. We said what do we want the ag panel to do? What is its purpose? And we put this together and said, this is what we have to do as a regulatory agency, we have a statutory obligation to fill in this table. Put it in an order and present it to the Board. So we, on the left hand column that's in light green, these are

the things that are legal requirements, they're on the table we have to address them, statutory requirements to address them. The rest of the columns are flexible. So we said that is where we need your help to fill in this information so we can bring it to the Board. That's what we've been asking for for two years.

JY (0:11:40) - And you specifically sent this to the Farm Bureau?

MT – Yes, this was the subject of the advisory panel meetings.

JY(0:11:50) - And that was over a year ago right? We haven't had any advisory panel meetings in at least a year.

MT – Yes, we presented it over, and over, and over again.

JY – Okay

AS (0:12:00) – This was also discussed, when staff was setting up the most recent stakeholder meetings we reminded stakeholders again that while we welcomed any input, we really needed to focus on getting these specific issues addressed.

JY – Okay, any Board comments or questions at this point?

AS (0:12:27) – So, if there's no questions about that then we should proceed with any questions about DPR coordination. We have a DPR representative here. I guess if the Board has any questions, we didn't prepare a presentation.

JY (0:12:59) – Dr. Sanders is here? Would you mind coming up Dr. Sanders? We appreciate your input into what was put into the staff report.

RB – Also Mr. Chair, Bob Lilly SLO County AG Commissioner is here as well. We don't have any other Ag Commissioners here do we? Thanks for being here.

JY – Have you, Dr. Sanders had a chance to specifically look at staffs proposed order?

DS (0:13:35) – I've had staff review it yes. I've looked at the initial order, yes.

JY – Right. Is there anything that jumped out at you that would be in conflict with DPRs mandate or regulations?

DS (0:13:50) – The primary point that we were concerned about as we understand it, understand your authority, you cannot require specific mitigation measures. You can require things like a water quality management plan which then people put in the management measures and things like that and you approve that. But outside of that, in the draft order there was, besides the requirement for the management plan there's also a requirement for a 50ft or some kind of buffer zone for application of pesticides. From our perspective that falls under our purview because our authority focuses on the sale and use of pesticides to protect people and the environment. Where as your authority is basically aimed at discharges. And from our perspective that particular requirement of a buffer zone fell under our purview and not yours. That was the primary concern.

JY – Okay. Do you require any kind of buffer with your regulation for the application of pesticides?

DS – Yes we do.

JY – And what is – how do you define that?

DS (0:15:00) – Well, we don't have any in place right now but the draft that we're working on, we basically had a lengthy, over a years process where we get with all the stakeholders including the various

Regional Boards, Ag Commissioners, agricultural groups, environmental groups, and solicited input. We put out a draft of what we were thinking of, which we're not required by law to do that but we know this is a very important issue so we did that to try and get something that everyone can live with and we believe we were effective. So right now we've taken those comments and we've got lots of comments just like you guys do. And my staff's revised that and it's under internal review right now. And we plan on after that happens and my management has signed off on that we'll begin asking the commissioners to comment and dealing with them because they are local representatives on the enforcement side. We will then be going to the Office of Administrative Law with a formal package which then starts the time clock for public comment and that whole process. Essentially, as I look at it our draft regulations if they're adopted as we propose, they're basically built on what I would call reduced use principals and pollution prevention principals. Primarily, we don't have a big database on mitigation measures and how effective they are throughout the State of California. These are meant to be statewide regulations. That's a hard thing to do because we have a lot of unique situations in California. So it's very hard to fit something together that fits the whole state. But that's our attempt to do it. We see that as only a first step. We have every intention I think of adopting some regulations. Although I don't want to mislead you that this is going to solve the toxicity problem. We believe it will reduce the adverse impact of pesticide use but it probably won't eliminate the toxicity that you're concerned about, not this first step.

JY (0:17:02) – Now when you say the toxicity that we're concerned about – we both represent the State of California, so I hope it's a shared concern….

DS – It certainly is…

JY – for, you know, for the end result.

DS – Yes,

JY – we just define it more…what we focus on and I know you're more focused on the application of pesticides.

DS – All I mean to say is that although we may be concerned about the toxicity too this first set of regulations is not going to eliminate toxicity from these pesticides, I would suspect.

JY – Do you envision that there will be a buffer set up statewide for surface waters?

DS (17:48) – The way they would probably be structured is there's gonna be a list of pesticides and supplies, it won't apply to all pesticides. In the original draft it had 70 pesticides. I don't know if that 70 is gonna survive or not. But it would apply to 70 that we felt that are of a particular concern. That was based on basically, we keep a surface water database of detections and we had 70 that were detected in the State of California, so we started with that. And essentially then depending on the kind of application you make, if you're doing an aerial application you're gonna have a bigger buffer zone than if you're doing a ground application. So it's set up like that. I think the minimum is something like 25 feet and the max is probably 150 feet, something like that, is what we were considering.

JY – Right, okay.

RB (0:18:38) – Mr. Chair can I interject something there? When we have the discussion about the similar coordination with Fish and Game and we're talking about riparian corridor and buffers with regard to creeks and I want to make sure that we know that we're talking about different buffers here. Because when you're talking about 150 ft setback for aerial that doesn't have anything to do with buffers or vegetated areas to protect a creek.

DS – No, this is basically from the edge of field to the sensitive water site.

RB – Right, two different kinds of buffer.

DS – Yeah, there not…I'm not familiar with what Fish and Game is requiring. These are the ones that we've kinda employed in the past.

RB – It's the same words, so I want to make sure that we're keeping them distinguished.

DS – Right

JY (0:19:30) – And then you mentioned the detection of pesticides in surface waters. What is your, kinda trigger point? I mean, in terms of wanting to take some kind of action – is it okay for pesticides to appear at any level in surface waters? Or is there some level you've determined is not good?

DS (0:19:56) – Our law talks about uncontrolled adverse affects. Which is not defined in the law and we have not specifically defined ourselves. It's been on a case by case basis. In the past we have used Water Board guidance about toxicity issues for putting pesticides into re-evaluation. And we're basically concerned about the standards you might put into place. Basically, historically our dept has been concerned about worker health and safety and public health. We haven't had a lot of experience in the environmental protection part. And essentially our law talks about protecting the environment. And that's kind of the extent of it. Particular to surface waters there's nothing more in the law than that. And so we've got this…it becomes a much more complicated issue to protect to environment than it does, if you think about it human health. We basically know what it takes to protect human health, reduce exposures. When it comes to the environment, it's a more complicated, complex issue. As I'm sure you're going to find out, and I already know. So, this is kind of the regulation we're talking about. Although we did adopt some dormant spray regulations previously and buffer zones that applied only to the dormant spray type applications usually associated with orchards and things like that in the winter time. We did that I think in 2007. These we're contemplating now would build upon that and maintain the dormant spray concerns or restrictions that are in the current regulations.

DMH (0:21:37) – Can you explain dormant spray? What is that method?

DS – It's a, it's well known among the industry anyway. But basically it's whenever a plant is in its dormant state, its usually referring to say, orchard type, almond orchards and things like that. They apply applications that kill insects and also basically eliminate the need for applying insecticides in the in-season. Like in June, July, and August. So it's a good approach for pest management but it also, because of storm water runoff and things like that it can add toxicity based on some of the compounds that are used. Does that answer your question?

RB (0:22:25) – Mr. Chairman?

JY – Yes.

RB – Dr. Sanders you answered the Chair's question earlier about, when he asked you about, conflicts between our draft order and your purview and that sort of thing. And you mentioned some of the applications, requirements and referred to your developing the draft surface water regulations. And what we had in our draft I think pretty much parroted your draft regulations. I think there was maybe one relatively minor exception. So, and Angela can correct me if I'm wrong, but it looked to me like staff was looking for, what are some ways to address that toxicity issue up there, saw that this is what you were proposing and included that in our preliminary draft. And your point is, well those haven't been adopted yet so to include it would be inappropriate. And even if it's adopted, in that case it would just be redundant. So, anyway I just wanted the Board to know that what we came up with was actually reflecting what they had in their draft surface water regulations. Any addition to that Angela?

AS – I was just going to say that we actually coordinated with DPR staff and were discussing that. And staff agrees with this notion of application versus discharge and we're working to revise language to reflect that. And the inclusion of the language was also reflective of the fact that they were not yet adopted. So if you look closely at the language it says, there's a note there about anticipated regulation by DPR. It was reflecting back to their draft surface water regs. With the expectation that they might come to bare before

this order was done, but we were not sure about that. So, we're coordinating with them on that and trying to keep them connected.

JY (0:24:25) – Has it gone to the OAL yet?

DS – No, the adoption probably, if it goes forward according to our schedule, probably wouldn't happen before the end of 2011.

JY – Okay. Yes, Dr. Hunter.

DMH – Thank you Chair Young. Just in looking at the staff report. It seems staff was not able to make a clear statement about how enforcement of the new regulations and compliance would be assessed and I wonder if you could talk a little bit about that for us.

DS (0:25:00) – I would start out by saying, first of all I would say we have a different enforcement paradigm than the Board does. Essentially you deal with individual permit holders on almost everything. We have a two tiered system in California on pesticides in the sense that we have a restricted materials list. That's about 50 or so compounds that are called restricted materials. A grower, if he wants to use it has to go in the Ag Commissioners Office and speak with the commissioner, get a permit, apply permit condition set restrictions before they can use that. But the vast majority of compounds in California are not restricted materials. And most of these compounds that we're talking about of concern are not restricted materials. So essentially if we adopt statewide regulations the commissioner would be responsible for implementing those. But there's not the resources to put a lot of effort into enforcing those regulations. The way the commissions go about it, first of all, they develop an annual plan of priorities in consultation with our enforcement branch. So, that's generally reflected, that plan is reflected in whatever problems they have in the county. For example if they have worker safety issues they would focus their investigations, their inspections on that. They do inspections, they're required to do so many inspections. Five percent of the total restricted materials. So if during the matter of that inspection they for example came across something they would, the inspector would look to see if they were also enforcing these particular, if we adopted these regulations, they would look at that and say okay, are you meeting those requirements. That's essentially the way that it works. But of course they're doing very few, they're not inspecting every grower, they don't inspect every discharge, they don't take samples. Historically the commissioners are - restrictions and everything are generally set up so it's something they can observe. Like if you, you know for a worker or something like that if you've got a half face respirator that's required to reduce exposure, that's something you can observe. The commissioner's not set up to take samples, they don't take air samples, or surface water samples, or ground water samples. If any of that needs to be done my department does it or we get the registrants to do it or we rely on other peoples' data. So for example, we're not relying on the commissioners to go out and enforce or to inspect every grower that uses these compounds. What we would do essentially is either DPR will conduct surface water monitoring or we would require the registrants to do it or we'll rely on somebody else that's already taking samples. And over a number of years see how, are we meeting any standards or toxicity issues. If we're not we'll be circling back to add further restrictions to the regulations. That's how our paradigm works. We're not basically investigating each and every grower and each and every application of pesticide. We don't have the resources to do that and neither do the commissioners to do that. So I'm being very clear about our kind of paradigm is very different from the Board's.

DMH (0:28:19) – So what triggers that kind of water sampling that you just described? What would move DPR to that action?

DS – Well, essentially we put these into regulations. We'll be conducting some sampling ourselves or we'll get the registrants to do some sampling over time. Again, we're not going to be sampling the whole state every year or anything like that. We'll have to prioritize like we do everything else.

JY – But that mechanism hasn't existed until these proposed regulations were put together.

DS – No, we have that in place already. My staff is out even now, we are conducting monitoring in various locations. We're looking for problems. We're not in mitigation phase yet because we don't have any regulations in place for this particular issue. But we always have ongoing monitoring studies that are going on. Again, I don't have the staff or the resources to sample every water body in the state but we prioritize things go where…. We also use the use report as much as possible to prioritize where things are being used. Because if compounds aren't being used you're generally not going to detect them.

JY (0:29:26) – The labeling requirements, they're found on these compounds on the bottles and containers. Do they address application of the compound to ensure protection of the aquatic environment? Or is it mainly for human health protection?

DS – The federal labels address both. But, and you've got to realize that the label is a federal law. To not apply according to the label is a violation and you can be fined or whatever. But again there's not somebody there looking at every application to see whether somebody is doing it properly or that sort of thing. There's also the way USEPA works, is many environmental statements are often guidance and not violations that could be actually prosecuted. The human health ones are usually generally much more strongly worded. For example you might have an environmental statement that says do not apply this near waters, can be toxic. Or don't let it run off. Well again that may be more difficult to enforce because it's not very specific. And there's not somebody there taking a sample. You know surface waters if it's a moving body of water it's there after the application then it moves off site and it's gone. So it's very critical when you take those samples. So the, I would say that although there's concern at the federal level and they put statements on those labels, again what's the enforcement, how does that come about? Again it has a different paradigm than what the Board is used to. That's how I would explain it.

JY (0:31:12) – Right. It seems like then if, you know when the Ag Commissioners are doing their inspections they're primarily focused on employee safety and things of that nature, that if application is not in process during the inspection then there's no real way for anybody to know whether the labeling requirements are being followed. And if you're not taking any surface water quality samples your agency's not going to know what's going on.

DS (0:31:49) – I think that correct. That's probably correct. That's the reason we don't use that as a loop back. We would use regional monitoring. And that again is a multi year process because you essentially can't take just one year's worth of data on that sense and say that we're meeting the standards or we're not meeting them. But basically we would use that data to say, you know after two or three years of not meeting the standards then basically we have to go back in the mode of further restrictions, implement through regulations. That's the paradigm that we use for environmental protection.

JY (0:32:21) – You know, we've heard Dr. Sanders, from some of the ag folks that there's just no way for them to meet a zero toxicity standard in receiving waters. That it's just going to be like an impossibility. Do you have any thoughts about that?

DS – I would tend to agree. Data would indicate that one to two percent of every application moves off-site. One to two percent of the mass of material moves off site. Now that could be in the air, that could be in the surface water. I think generally speaking for most of these pesticides, they're toxic compounds we purposely put in the environment for pest management. Many of them are insecticides, therefore they're going to be toxic to many aquatic insects. And we're talking about standards that Region 5 has developed for example, we're talking about one part per trillion as a standard. I sincerely doubt that you can continue to use pesticides and not exceed a one part per trillion standard in surface water. That's what I suspect.

JY – Okay. There's a comment, an answer to a question, number six on page seven. And staff put in here…Staff has worked with DPR and the manufacturers to understand how these pesticides enter surface waters and which management measures prevent them from entering surface waters from agricultural and urban lands. Do we not have a body of knowledge or science on that issue before this problem has popped for us in Region 3?

DS (0:34:09) – Well I guess it depends on who you talk to. But for example, my own staff has conducted studies on like vegetative ditches. And looked to see how pesticides would be extracted by a vegetative ditch. And the problem is it depends on what pesticide you're talking about, the angle of the ditch, you know, how fast the water moves through there, what plants you're talking about. In order to make a statewide regulation we'd have to have a heck of a lot of data to determine what should be the density of plants, which plants should be used, the velocity of water where this is effective. And then it depends on what pesticide, are you talking about a pyrethrum, or are you talking about an OP? It's variable. And there's not a large amount of data on that, there's some data on that. There's on data on vegetative ditches. It may not apply to pesticides, it may apply to nutrients and that sort of thing. But again, it depends on what pesticide you're talking about, the density of plants, what plants. What kind of plants you're gonna plant. That kind of broad information that's gonna be applicable in California is not available. That's the reason why our current draft regulations doesn't depend on specific mitigation measures that I have data on.

JY (0:35:26) – Can a properly designed vegetative buffer with the right angle, the right plants, capture pesticides?

DS – Yes they can. The data shows that they can but it's not 100% effective.

JY – And elsewhere in here there was discussion about compounds. I hope I'm getting the right one. Is it Loram or something like that? Angela, do you know which one?

DS – Landguard?

JY – Landguard.

DS – Yes, that's a commercial product. It's an enzyme that can deactivate some of the OPs. And I think they may have a new one out for some of the pyrethroids. As I understand it that's an enzyme that's actually developed by the Australian government that then licenses out to the private industries to sell it. It is available in California. I don't know how widely available…I think it's expensive. I've seen data that would indicate it's very effective. But I think it's, I don't know the economics of all that. But it does seem to work at least for the chlorpyrifos and diazinon and at least, I understand there are some pyrethroid enzymes out there too, which I haven't seen the data for that.

JY (0:36:35) – Okay. Alright, any other Board questions or comments? Thank you very much….

DS – You're welcome.

JY – for making the trip down here to answer questions and to give us input on this. Thank you.

DS - Thank you.

JY – Okay, so we have Fish and Game?

AS – Right, Mr. Hill?

MH (0:37:09) – Good afternoon, Mike Hill, Fish and Game, Environmental Scientist.

JY – Have you looked at our proposed draft order?

MH – I've seen parts of it. Essentially, you're proposing a buffer strip of vegetation between the outer edge of riparian vegetation and the disturbed field. Right?

JY – Right. Does that conflict at all with your jurisdiction?

MH – No, it really doesn't. The reason I say that is that under section 1602 of Fish and Game code we have authority to regulate activities from the edge of, well the top of the bank and the riparian zone, across the stream to other top of the bank and riparian zone. You're actually proposing a buffer that would be outside of our 1602 jurisdiction. So if there's a project where somebody is doing work in a stream we can add a buffer as a condition to that. Or if we have an enforcement action under our pollution law 165650(?), we can require a buffer zone from the outside edge of the riparian zone. But generally speaking, no. Your draft is not, or your proposed does not conflict with ours.

JY – Okay. And, what our staff is focused on doing is protecting riparian corridors.

MH – Right.

JY (0:38:35) – Does Fish and Game have any information that it collects in terms of riparian corridors that have been impaired or in a degraded state that need attention? Need restoration?

MH – We have provided some information to your staff on streams in at least San Luis Obispo and Monterey Counties. Those are two of the three that I'm responsible for. I don't have access to Santa Cruz or Santa Barbara but I know we can get that. We do also have…so yes we can provide that information. We do have some information on it. We also have a program, our fisheries restoration and grants program, and our board member for that is not here, but that does have some components in it for protecting and restoring riparian vegetation along stream corridors as well, particularly for selmona(?) streams.

JY (0:39:32) – Does Fish and Game have any ongoing effort that addresses restoration of riparian habitat or corridors?

MH – That would primarily be through the restoration grant, the fisheries restoration grants program. Where people such as Land Conservancy of San Luis Obispo or some other non-profit group will seek funds for some of the projects to help restore vegetation or restore fisheries habitat along some of those streams.

JY – Okay.

RB – But that is strictly through grants then?

MH – Primarily, yes.

JY – Okay, any Board questions or comments? Go ahead, Dr. Hunter.

DMH (0:40:19) – Thank you for coming here today to help us get a little more light on this – these questions. There is…my question is, is there any formal agreement? Or any way we can…there's a recommendation here that it would be helpful to include, that project proponents must contact CDFG and its army corps of engineers for any work proposed within riparian areas. So does that mean you're suggesting that our permit should include that requirement? Or how do you see that happening?

TRACK 1021

MH (0:00:00.1) – We would love to see that. Not a question as a requirement but at least as an advisement. I've been lobbying our counties…I handle San Luis, Monterey, and San Benito counties and I've been asking the building departments there to a least have a pamphlet or some sort of a handout that when someone is applying for a building permit they know what other permits they may need to get. Whether that be through the Army Corps or Water Board or whomever, Fish and Game. Because there have been several instances…I've been doing streambed agreements for ten years now…there have been several instances where somebody has gotten a Fish and Game permit, or excuse me not a Fish and Game…a building permit or something else, and then been told afterward when they think they're ready to go to work, that they need something else. So in our streambed agreements we put in an advisement that you

may need authorization from other agencies including Fish and Wildlife Service or others. So we would actually like to see that as at least an advisement, not necessarily as a requirement, but at least an advisement.

DMH (0:01:03) – Yeah. So is that something that can be accomplished Angela? Do we have that guiding language?

AS – We have that comment and staff is looking at that comment and how to incorporate that language, yes.

DMH – Okay. Let's see if we can make some headway on that. I know, I think that's very frustrating for folks going through the permitting process because it isn't clear. It's not one manual you can go to and say, this is what will be required for you in this location, for this period of time.

MH (0:01:30) – Exactly. I was struggling doing that in the streambed agreements nine years ago when I issued an agreement and met with somebody and asked him if he had his Army Corps permit and he looked at me with a blank stare. And I just realized that at the very least we can tell people about other requirements.

DMH – And do we have active at this point, do we have active streamline permitting programs where an agency, for example like an RCD is carrying a permit for a period of time that everybody can work with them in terms of a one-shop-stop kind of permit? Do we still have those programs in place?

MH – I have been working very hard with the Upper Salinas, Los Tablas, RCD to get a, it's called a Partners in Restoration Program through. And we signed off on it with a MOA between the RCDs and Fish and Game. And I believe they're supported by the Water Board here. I think there's one other agency, being the Army Corps that's still kind of in process but we're with that. We also have one with the Upper Pajaro Watershed, the RCD up there.

DMH (0:02:38) – Excellent, because I think that's another jurisdictional kind of anchor with these issues. And we should be collaborating with that process, so I'm hoping…. Okay, thank you.

RB – Mr. Chair?

JY – Yes?

RB – Chairman Young asked you earlier about is there a conflict between what we have in our preliminary draft versus Fish and Game regulations and that sort of thing. You said no, there's no conflict. But looking at it the other way, do you see a benefit to your mission? And you talked about fisheries restoration, do you see a benefit to what we have in the preliminary draft?

MH – I do. I can't speak to a specific numeric limit on your buffer zone. People ask if we have buffer zone requirements, we actually do not. We don't have a formal buffer policy. We'd love to see 100 feet and that's what I tell people but we also recognize that those are cases-by-cases basis on the different streams. You can't go necessarily with one number and figure that can be a one-size-fits-all limit. But, yes from my experience buffer zones are pretty effective at helping to keep, at the very least sediment out of streams. In fact that was the subject of my thesis at Cal Poly, was using different methods including buffer zones to keep sediment from leaving a site. So we do believe it would be a good thing. We also believe, from a sediment standpoint, we also believe it would help with wildlife habitat as well. So, long answer, yes.

RB (0:04:21) – And, you know one way of looking at is that there are really two different issues involved with riparian corridor and buffers. You actually talked about both of them. That is, you talked about the benefit of trapping sediment and of course a lot of things are attached to sediment too, including pesticides. But, and then you also mentioned wildlife, so then that gets into the issue of not just the buffer idea to keep pollutants from moving into the waterbody, but then the health of the riparian corridor, right? Which could

include canopy and the shade that's provided, lower water temperatures, and all that good stuff. So there really kind of two angles, two ways of looking at it. And do you…we've seen examples of creeks or ditches that used to be creeks that are bladed, you know within the banks. So is that something that you get involved with when you're…how does that work?

MH – Yes, I've seen some of the photographs and I've seen some other creeks. We do not allow someone drive a dozer down the middle of a creek and clean it out so to speak. Because it's just bad management practices. I've only been involved in a couple enforcement actions where someone has done that. And we've required as a condition of enforcement, or settlement rather, to restore the creek back to approximately its pre-existing condition. The examples that were provided to me in the photographs that you've probably seen, I think were done probably done 15 or 20 years ago and it's not something Fish and Game would authorize now under a streambed agreement.

RB (0:06:06) – Well, the photographs aren't that old. The photographs are recent but you're saying the work…

MH – The work, yeah I'm sorry, yeah. It's definitely not something that…

RB – But to maintain non-vegitated state, doesn't that require ongoing work to…

MH – Yeah, and that's usually playing with herbicides and other things, yes. And I've seen examples, photographs of that but it's not something that we would permit. If we found somebody doing that we would take enforcement action or regulatory action to prevent it.

RB – So that's a matter of somebody just reporting it to you.

MH – Exactly, we have a handful of game wardens. I'm the only streambed alteration guy for those three counties. We have three game wardens in San Luis County. And I think three or four in Monterey County. Most of the reports that we get come in from our CalTip or a neighbor reporting on another neighbor. Or somebody happening to drive by and see a violation in progress. And I work on about 15 or 20 of those a year.

RB (0:07:10) – Does that mean that you're able to actually respond to all the complaints? Or do you end up with a backlog?

MH – If we get reported, the warden goes out and investigates it and if there's an issue they will take enforcement action against it. And if I need to get involved I will. I support the warden, I don't do enforcement myself.

RB – Right. Okay, thanks.

JY – Who's the warden for Santa Barbara County? Or, stream alteration?

MH – Santa Barbara is outside of my region but I believe the Northern County is Jamie Daustile(?). Northern part of the county.

JY (0:7:46) – Okay. So, staff we don't have information for Santa Barbara County? Or do we? It sounded like Mr. Hill had provided staff with everything for San Luis Obispo and Monterey Counties?

MH – I was able to get some information for those two but Santa Barbara is out of my region, as is Santa Cruz.

JY – Do we have that information?

AS – I'll have to defer that question to Jill North.

JY – Well, how about this. If we don't have it we can find out later, after the meeting. But get it. Okay.

MH – I'll give you a contact. I have contact information here.

GS (0:08:24) – One quick question. When you have these sorts of enforcement issues do you ever contact our Board, or our staff?

MH – Oh yes.

GS – I just want to make sure there's a lot of cross….

MH – I want to give some props right now to Dave Innis and Jill North and Jennifer Epp. And, when she was here, Jennifer Bitting.

GS – Great.

MH – Yeah, we work together a lot.

JY – Mr. Thomas.

MT – Mr. Chairman. When you say get information on those counties what information do you mean?

JY – Oh, it's the, uh…

MH – The impaired watersheds?

JY – The impaired watersheds.

MH – The areas that need the, that have issues with riparian vegetation is what I understood.

JY – Right.

MT – Okay, thanks.

JY – Okay. Thank you very much.

MH – Oh, you're quite welcome.

JY – Anything more for staff's part of this?

RB (0:9:20) – Well, there was the third part, third part in from the enforcement report on the implementation and we've provided the pretty extensive write-up of where we are with implementation. So I think we just want to take any questions on that.

JY – Okay. Now that's in item 12 right.

RB – Right.

JY (0:09:42) – Does anyone have questions on that? No?

DMH – This has to do with the…does this include the cleanup of Nipomo creek?

Several Brd Members – No, no.

JY – No, Item 12, that was…

AS – That was part of the EO report.

DMH – Then Nipomo Creek is part of EO. Okay, then I've got comments on that.

JY – Okay. But I do. My comment is…is staff going to be able to get this database management issue resolved in the near future? Or is it gonna take a protracted length of time?

AS (0:10:42) – That's a good question. It's one of staff's highest priorities. We see the database, and I think Preservation, Inc. would agree, as one of our main tools for all aspects of implementation, in terms of enrollment, enforcement, etc. So, it's one of our highest priorities to get that correct. As program manager I'm responsible for pulling that together and am being assisted assistance from staff. And our first step is to bring that database in-house so we can fully evaluate it and make sure it's appropriate and sufficient for our regulatory purposes. And that's where we are right now, is in the process of trying to do that.

JY – Okay. What is your estimated timeframe for getting it in-house?

AS – That's happening right now.

JY – Okay.

AS – Preservation, Inc. has provided us with access and we're working on doing that right now.

JY – And your estimated timeframe for getting the database troubleshooted and working the way you would like it. Is it a six month project? A year project?

AS – It's less than six months. We've been working very closely with Dave Paradies as well as with our IT support here at the Board. And so it's something that we're looking at doing directly after we are able to bring it in-house to evaluate it.

JY – Okay. Alright. Yes, go ahead.

DMH – Thank you. I realize the 13267 orders - I did have a question on that. I'm just wondering if you can talk a little bit about this. As I recall we were going to follow-up with Monterey County. Both the Dept. of Water Resources and Environmental Health. Did we get data, ground water data from them? Do you know?

AS – Are you speaking about…?

DMH – On the 13267 orders that went out. We sent notices on, to San Jerardo area? Landowners regarding ground water nitrate levels.

AS – We have received the DPH data for the San Jerardo wells.

DMH – For Monterey County?

AS – It is the Monterey County data however we got it directly from San Jerardo.

DMH – Oh, okay. Alright. But I was interested in seeing some follow-up with the county and with the Department of Public Health. Is that happening?

MT (0:13:14) – We're continuing on that yes, we are. We're working on that. And, it's a sensitive thing to get that data. So there's a lot of back and forth between our folks and the county folks. But what data, what we're gonna do with the data, and what form that data is in, but we think we can get it. We're thinking positively. But yeah, we're definitely working on it. We think we can get it.

JY – Isn't that public information?

GS – Which agency is that?

MT – Monterey County Water Resources Agency.

DMH – But what about Environmental Health? I thought Environmental Health also had well data that we could easily get. And my understanding is that they are real willing to share data.

MT – Yes, my understanding is that also. I was talking about the county, Department of Health they usually are. Their databases in my experience are much more limited but we can get that information. We would like to get the county's database, it's much more extensive.

DMH – Right, okay.

MT – And we're definitely working on that.

DMH – Okay, thank you.

JY – Mr. Weeks told us at the last Board meeting that he would give us the data.

GS – That and a dollar will get you on the bus…I guarantee you.

JY – So what do you have to do? I mean, it's September. It shouldn't be a big deal. And what other tools do you have to use to get data from another agency?

MT (0:14:40) – Well, all we can do is request it. If they refuse to give it to us then I'm not sure what our recourse is. But they haven't refused yet so I don't want to give you the impression that we won't be able to get it. If we can't get it we'll definitely let you know.

JY – What's your timeframe then for taking the alternative course of action?

RB – We expect to send the, so far Matt Keeling of our staff has been talking with their staff, Cathy Thomasburg and their more database oriented guy, who's name I forget at the moment. And he has communicated with them email wise with the delineation of the way the data should be transferred to make it the most usable to provide that for them. Tabbed data cells I guess it is. And we expect to follow-up with a letter that will basically take that information and put it in a letter form and I hope to sign that this afternoon or tomorrow. And so we'll go from there. But we haven't actually sent the letter to them yet. Matt's been working with them one-on-one.

JY – Okay, let me know how that plays out.

RB – Okay. And by the way, at my suggestion we, in the draft letter, we've parroted a lot of what Curtis Weeks said to the Board in terms of promising information.

GS – And who are you sending this to?

RB – To Curtis Weeks.

GS – Okay, why don't you copy Lou Bowman and the county supervisors. Lou Bowman's the CAO. Thanks.

RB – Okay, thanks for the direction.

JY – Okay. Anything else, Roger? Dealing with the ag issues as part of 12 and 23?

RB (0:16:35) – Not unless there are more questions, I think…well we have the card. We have a card here.

JY – We haven't gotten to cards yet.

RB – Okay, I think that's it isn't it Angela?

DMH – Nipomo Creek?

RB – We're gonna deal with that after this.

DMH – Okay.

JY (0:16:55) – Okay, so let me just make sure. I just have two cards here Kirk Schmidt and Darlene Din.

RB – These are all for public comment. These are all public comment.

JY – Right, okay great. Kirk?

KS (0:17:09) – Thank you. Chairman Young, members of the Board, Mr. Briggs. I'm Kirk Schmidt, I'm Executive Director of Preservation, Inc. We have joint access to the database that's been in question. The report that implies we manage on our own the database is not true. The database is owned by your agency, it's managed by your agency. We have access to and the ability to edit the information in the database. Preservation, Inc. is a non-profit, we do not represent farmers, we do water quality monitoring and do education with farmers. And we are not a coalition in the sense of the Central Valley. And in that regard we again don't represent farmers. We do cooperate on the database and have since it was established in 2006, after our first billing was sent out in 2005. Every year since then an update questionnaire has been sent to all of the enrolled growers asking them to indicate if there's any change in the property they're farming. This was not sent out last year. And one of the big problems with the database now is because of the lack of an annual update. There is a tremendous confusion as to currency of the information regarding each of the enrolled growers. Because many growers change property frequently and many of them want to make sure the information is correct so they pay the correct amount for what they're presently farming on. In the past that information has been sent out in October. Preservation, Inc. has a self interest in this because we send out bills to our growers in December using the information that's updated from the October mailing. And last year when this didn't occur we found that there was a huge percentage of growers that were willing to pay for participation in cooperative monitoring but could not because of inaccuracies in statements we sent out based on the information contained in the database. In the past we have been allowed, Preservation, Inc. has been allowed to make edits to the database to correct acreage and mailing addresses and we never dealt with any of the other information in the database that deals with farm practices or anything else. This now is becoming an issue because the procedure upon which we embarked upon this was somewhat informal. And we can have a much more formal procedure, and we're quite happy to follow any procedure you like. It's just that none has been established. If no new update goes out we're going to be besieged by farmers who want us to make corrections in the database, we need to know now what the formal procedure is. The Notice of Termination form is still on your website, excuse me the Notice of Modification is still on your website. The Notice of Termination is not on the website. It would be helpful for growers to have access to this information so that not only could they tell us a change in acreage but they could also easily notify your office of change in acreage. But more important, besides sending out updates in October, it would be very helpful if someone was reassigned to be a manager of this database in your office. Because this position hasn't been filled for some time, since Mr. Meertens was reassigned to the TMDL staff. In the long run, and I think you should talk to Mr. Paradies even in the short run, the format used for the database is Microsoft Access and it's insufficient for the volume that you have. It would be important to migrate this database to a new database. It does not have to be done today, it does not have to be done next year. But if you're going to adopt an ag waiver that has a higher level of linkage between practices and monitoring and all these other things the present MS Access database is totally incapable of dealing with that amount of data. And is also incapable of linking things such as pictures and documents the way you can do with a more sophisticated database. And we're not talking about that much expense for this. And finally, as I raised last time at your Board meeting in Watsonville, I think for enforcement to be fairly and uniformly applied, the information in the database needs to be accurate and

your staff needs to be able to find this information in a relatively easy way. One land owner was told that their (?) was not in the database when it truly was in the database. Well, if that's the case it's clearly either, the database is not well setup which could be the case, or additional training and cooperation between our two entities, whether it's Preservation, Inc. or your staff, would be beneficial to make sure that everyone understands how to access what's already in the database. But again, it's your database. You can prevent Preservation, Inc. from using it by sending us letters saying you can't use it. We will then get the information from you and send it out for bills and when they come back incorrectly you will not have the benefit of having our booking staff, which is one part-time person, make corrections in the database, which is clearly to your own benefit. Thank you.

JY (0:22:20) – Mr. Briggs?

RB – By the way, the Board received your letter. And I distributed that at the…

KS – Thank you. I wasn't concerned about that, I knew they would receive the letter. I appreciate that.

RB – Okay. And as Angela Schroeter said it's a very high priority and we're talking about a relatively short timeframe to resolve it.

JY – Is Dave gonna be working on this?

RB – Dave has been working on it. Gary Nichols, who is our IT guy, has been working on it.

JY – Dave, is this solvable?

DP – This is solvable and I think we can do it in incremental way so that many of the more pressing problems can be dispensed with over a period of weeks. Setting it up with Gary and several other staff here to resolve the database technical problems with the slightly new and different design that uses the original but it expands it to meet the other needs.

JY – Do we have enough staff?

DP – I don't know about the staff allocations. I look at the skills of the staff that I've spoken with staff with respect to this, and yes we have the talent in-house. The staff allocations aren't part of my technical considerations.

JY – Right. Well, I think there's a lot we've gotta do you know, I was thinking you know. And Mr. Schmidt is talking about maybe having someone kinda dedicated in part to being able to manage it, to keep it up to the date. Because there's changes going on all through the year with it. Are there any grant funds somewhere? That might help with a part-time position?

MT – Funds for a position, no. With the condition the State is in right now and the budget situation, hiring someone is…

JY – Out of the question.

MT – Out of the question.

DP (0:24:17) – I might want to elaborate a little. The proposed design that I'm looking at, that I've discussed with Gary Nichols downstairs, would involve a startup where I would work with Gary to do the fundamental moves and conversions. Kirk Schmidt has been quite forthcoming in cooperating and giving me access to everything on his service that I need to see. As I say, I did chat with the other staff to figure out what level of expertise they had so that our new version would be tooled to fit their hands, if you will. So that we don't need to become, we don't necessarily need a very high level database administrator for this.

JY – Okay, great.

AS – Can I add something to that? Just to clarify the situation here. There are two issues. There's the physical infrastructure of the database and the technical details of the software and application. That's one issue. The second issue is the content and the ability for the Water Board to conduct their regulatory program based upon the content. We need to look at both of those things. And there are issues and challenges with both of those things. So it's not just as simple as getting the system here and making it work. Technically, I absolutely agree we can do that. I also think we can do the latter, it's just that we really need to do a comprehensive evaluation of the whole thing.

MT – And the second part of that, Angela, part of the dealing with the second part of that…the content of the database, has to do with renewing the order. What we require to be submitted to go into the database. That's a fundamental aspect of this new order.

JY (0:26:00) – So the database has to be worked out before you can really start to implement the new order.

MT – No. We can implement the new order and we can have time schedules in the order with respect to submitting data that are tied to when the database is ready to receive the information.

JY – Okay.

AS – And what we're considering as part of the new order is necessary, fundamentally, for the program implementation right now. And so we're identifying, addressing, and making some of those improvements right now.

JY – Okay. Alright, thank you. Darlene Din. And then Steve Shimek, and that is the last speaker cards for this item.

DD (0:26:47) – Good afternoon, I'm Darlene Din, thank you for the opportunity. I just want to respond to one document that Angela showed up on the screen. I'm a consultant for multiple associations and I have not sat on the ag panel, nor do I sit in any of the direct staff as it pertains to the working group but I do assist ag working group. What struck me on that document is what Mr. Jeffries brought up on communication and effectiveness on people understanding. If that was the intent of the Regional Board staff that they wanted that document answered, then that should have been the document, the sole page in the February 1st order. I think where the miscommunication came from, I'm talking from a layperson's point of view, when I read the order I went in to respond to statements within, what was addressed by staff. Farmers are really kind of simple business people on looking at the objective. If that was what you wanted filled out…

JY – But it wasn't, Mrs. Din. It was just kind of my throwing out a question…by the way did you…

DD – But I'm not saying that, but I'm saying then it would have helped if it was even the summary page. Please refer your comments to answering these specific targets and referring back. In fairness to people such as myself who spent hours on the phone asking growers to give the most honest comments that they could, to respond to the best of their ability. They responded where that was at. And to say that all those 1200 comments didn't respond to that…I just, for the sake of clarity, if that was what staffs intention had been, I just would have appreciated that because I would have done due diligence on talking to the numerous organizations that I worked for, that if there was answers that they felt they could give that they would have. And, Mr. Young we're trying to be cooperative, and that was mainly for the purpose of explaining that that was never my understanding that that was our objective or I would have taken that more to heart. And this is the first time I've personally seen that document. Thank you.

JY – Yeah, and that wasn't staffs intention.

DD – Well, because the comment was arised today, I just…and I'm not, this is not to say anything discrepant about staff or the Board. It's just when the question was asked, and can they fill in those boxes?

If from me being very practical, if this is the first time today that I'm seeing this document, not saying that my organizations haven't, and I did know that they wanted milestones and targets. My opinion was that's what we had responded to. But it's obvious there was a communication differential between what staff perceived as milestones and what we should respond to and what we did. More for clarification and that would have been very helpful. Thank you.

JY – Okay. I'm sorry I raised the question about that. I mean, I generated that, staff didn't. You guys responded in the appropriate fashion. All that work you put in was not for waste. Not for not. But I think what staff was saying was, in culling through everything, and trying to match up specific responses to some of these issues, they weren't finding specific information. That's, I think…is that right Angela? Or not?

AS (0:31:02) – That is correct but let me also add that the table, and Darlene mentioned she wasn't part of the panel, the table was shown as-is to the panel. It was our understanding that they were working as representatives of agriculture and working with individual growers and other ag to communicate about these issues. It actually was included in the February released staff report, not as a table, as bullets.

DD – And I'm just saying I didn't understand that….I apologize.

AS – Yes, and that's a fair comment but this is where we were headed and this is what we were asking for and it's unfortunate if the communication got crossed.

RB – I think the table pretty much as-is was extracted from my December letter, right?

MT – It is created from that letter. The letter says that this is what we are going to do in the panel.

AS – And then it replicated the information in that letter in our February staff report and release.

JY (0:32:11) – But this presentation does make it easy for someone to look at it…

AS – Absolutley.

JY – and focus in on really what you guys are looking for, specifically so.

MT – And in the panel, it wasn't that people didn't understand it. They did understand what they were looking at, and many of people in the panel said, no. I'm not going to go with that. No thank you.

JY – Well, Mrs. Din at least there's plenty of time to take this and to focus in on what's…

DD – Yes, I appreciate it, thank you.

DMH - Is that up on the website?

AS – We can put this presentation on the website.

JY – Yeah, I think you should put it on the website…

DD – Thank you.

JY – make that easy, an easily identifiable link. Okay, Mr. Shimick.

SS (0:32:55) – I'll be very brief, Steve Shimeck, Monterey Coast Keeper. I just wanted the chance to respond to some of things and give you a different view of working with DPR. Dr. Sanders said that this Board cannot require BMPs. We've actually looked into that and I think it's a legal question. And I think it is slightly unanswered, I think that there's room for two different opinions. And I'm not a lawyer but we have had lawyers look at it. And it is our lawyer's perception at least initial perception, that as long as there's an alternative, in other words in a conditional waiver setting, you can require BMPs, you can

require practices. Because the grower has the option of going for an individual permit and waste discharge requirements. So a grower does not have to participate in the conditional waiver program. They have an option. They can opt out if they don't like the conditions. So that's the opinion that we have from our council. And secondly I think there's a practical standpoint. You said well, we'll take other people's data, other people's water sample if somebody brings us a water sample. That's not my experience. You know, we have been out in the field taking pictures of a applicator, professional applicator, with a mask on, spraying a ditch with open water, running water in it. We have grabbed a sample. We have taken that sample with a letter, with the photographs, with the sample. And the Ag Commissioner, County Ag Commissioner says, we won't take your water sample, we have to collect it ourselves, and by the way we don't have the staff or time. That's our experience with DPR…well, with the Ag Commissioners. I would like to just point out, that again that if you look at the evidence, in other words, where the water quality problems are. If you look at the data with Karen Worcestor's very good tool. The most toxic site on the Central Coast is the reclamation ditch at La Guardia, that is the most toxic site. That site is 100 yards from the Ag Commissioner's office. Now I'm not saying that the Ag Commissioner had anything to do with it. I'm simply saying that year, after year, after year, that site has been toxic and been right in front of the Ag Commissioner's nose. They're not prepared to do anything about it. I hope you do. Thank you.

JY – Thank you for your comments. And I would encourage your attorney to send us whatever authority he or she thinks the Water Board can use to use BMPs for pesticide use.

SS – Thank you.

JY (0:36:04) – Okay? Alright, I think we want to finish with number 23.

RB – Okay.

JY – And so we would then go to the Nipomo Creek update. That would give Dr. Hunter…

RB – But before we get to that… No, but seriously let's kinda march through. Are there any questions on the water quality certifications?

JY – Any questions? Board? Mr. Shallcross?

GS – Not a one.

JY – Okay. Down at this end? I don't see any Mr. Briggs.

RB – Okay. I won't mention the other topics that are in here, I'll just as if you have questions. Until we get to an item that I think there is a question on, and that would be on page 13. Nipomo Creek.

JY – Dr. Hunter.

DMH (0:37:07) – Okay, so I'm very glad to see some action has occurred. But I am kind of surprised because we've seen some extraordinary photo documentation from the local community, in the form of the Nipomo Creek Dogs, documenting what they feel to be an overwhelming issue. And on this inspection…I guess what I'm trying to do is just understand the context and the range of this inspection, relative to where the sites are occurring according to the reports we're getting from the local neighborhood group. Can you give me some way to put this in perspective? Because it says they saw very little, and it was remnant, and it wasn't active, you know, material effectively being disposed of improperly, and all the things that they seem to have documented, actively documented.

AS – So what you, what is in the staff report, in this month's EO Report is reflective of an evolved situation. I can't, I don't have my notes in front of me, I apologize but I think it was in December maybe, that we first started looking at this in detail. And at that point in time staff did issue a 13267 to the landowners in that area with specific requirements about information that they needed to provide. So, this

inspection that you're hearing about now is after some activity has occurred. So I think that's probably what you're reacting to.

DMH – So notices went out to the area more broadly.

AS – Right.

DMH – What triggered the inspection of these two particular land owner…is it one or two?

AS – It was two. They planned one but when the got there they ended up doing two properties.

DMH – Okay.

AS – It was based upon the complaint and the observations that had been documented. As well as follow-up to the 13267 letter that went out in the response from the landowner.

DMH – So do you think that the letter triggered cleanup?

AS – That's what's been reported. And in fact, the submittal of both the farm plan and evidence related to the cleanup regarding the first 13267 describes the activities that were done. Cleanup occurred, staking was done. They submitted their plan for ongoing maintenance. And then what occurred most recently was a follow-up to make sure that those things had happened. And as you read there were some minor issues that staff found regarding staking and some remnant irrigation tubing and was following up again with follow-up to that inspection and another 13267 to require some information to document those corrections that were made.

DMH – So, are we satisfied that we've had a good outcome? Or is this an ongoing issue? It sounded like we're pretty much closing that…we're turning that page. But I just want to understand where it fits into the stream of things.

AS - There is some outstanding information that must be submitted. But outside that staff is confident that improvements have been made and are in place to prevent ongoing pollution in that area. And we also have been coordinating more closely with the local cleanup groups to report to us if they observe additional indication of an ongoing problem.

DMH – And then my last question is where this fits into the ag waiver. Is there language that will be incorporated in the ag waiver regarding irrigation tubing disposal and those things?

AS – The preliminary draft includes that language, yes.

DMH – Great, okay. Thank you.

RB – If you'd like I can send you and the rest of the Board members the most recent letter which includes, it had photographs attached that, you can kind of see some of the remaining issues that we're asking them to address. Okay.

JY – Okay. We're going to dispense with the rest of the EO report because it's just kind of written information. And then we'll move to public comment. …